Telephony.

THE AMERICAN TELEPHONE JOURNAL

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PRIZE CONTEST ARTICLES CAN AID TELEPHONE MANAGEMENT

Announcement is made on another page of this issue of the winners of prizes in TELEPHONY's second article contest. With the monetary rewards also go TELEPHONY's congratulations to these 12 telephone men and women who have written so entertainingly and instructively of their work.

Our subscribers, likewise, are to be congratulated, for they will soon have the privilege of reading these prize articles, which deal with all phases of telephone work. Their publication will commence at once, and they will be found of unusual interest.

The number of articles submitted for this year's competition was greater than in 1924, and—without disparagement of those who entered last year—generally of higher grade.

* * * *

Many meritorious articles were received (and many have been accepted for publication) that did not win a prize, but their authors have no occasion to feel discouraged.

In view of the many excellent contributions entered, judgment necessarily centered on what would appeal most effectively to the greatest number of readers. For that reason the article successfully dealing with a subject of interest to the many must take preference over the article—although in other respects equally worthy—which appealed to the comparatively few.

TELEPHONY is keenly gratified at the high grade of contributions received from the telephone field, and is happily sure that its readers will be pleased when their publication begins.

Sincere thanks is extended to all who cooperated in making the contest so successful and assuring that TELEPHONY will be more interesting than ever during the ensuing year.

* * * *

Representatives of both the telephone groups—Independent and Bell—participated in the competition, submitting valuable and helpful articles on various branches of telephone work, and each group is represented among the prize winners.

Of the 12 prize winners, four are women, which is not at all surprising when we observe how important a factor women workers have become in the telephone industry. Neither is it surprising that the women should have made a clean sweep in the traffic section of the contest, taking first, second and third prizes.

Several contributions were received from foreign countries, one—from Brazil—unfortunately arriving after the closing date of the contest, which was due, probably, to delayed steamer mails. All were meritorious, however, and will be considered for publication later. It will be noted that Canada is among the prize winners this year.

* * * *

The efforts of this journal to stimulate interest in telephone work and help service companies to improve their methods—which is the aim of the article contest—would seem to be of special importance at this time. Public utilities stand high in popular favor right now, and all companies rendering utility service to the people should embrace every opportunity to still further improve their work and continue to deserve this good opinion.

As pointed out before, the importance of good management among telephone companies is apparently increasing, and no way of effecting proper economies and securing greater efficiency should be neglected or overlooked.

Information leading to ways and means of bettering the management will be presented in this symposium of prize articles, and its practice use will enable companies to strengthen their position.

The telephone business is a good business—more firmly entrenched in the popular estimation today than ever before—and telephone men need to be reminded of that fact now and then. The reason is that every one is so close to "the same old job" every day that he often fails to get the right perspective.

* * * *

Rendering telephone service to the busy American people is a mighty important job. There is plenty of evidence that the people themselves are appreciating its importance more every day. That, of course, makes it imperative that the telephone fraternity should keep on their toes, ever ready to keep pace with the demands of the times.

One of the leading weekly publications of America is conducting an advertising campaign, the slogan of which is: "The home with a telephone is the best market." It asserts that one-third of the country's homes have telephones and that they buy two-thirds of all the advertised commodities sold.

Here is an extract from one of its advertisements emphasizing the significance of the telephone as a business factor:

"Consider two families living side by side on the same street—the Joneses and the Browns. The two homes are not strikingly different. The Joneses' is a little better built and a little better kept up. The grocer's car, the milk wagon and the postman stop a little oftener at the Joneses than at the Browns. The Joneses' home is better furnished. There are more of the luxuries which have become necessities—a phonograph, a radio, a car. You will find, if you look up the tax records, that the Joneses own their home, while the Browns rent theirs.

It is difficult to learn such facts. Even if you could look inside these two homes, you would not be conscious of the really striking difference between them. That difference is one of state of mind. But one sure method of discriminating is the telephone wire running to the Jones house and not to the Brown house.

The telephone is the symbol of the difference. It does not make the difference. It simply means that when the Jones family had risen to where life was sufficiently full of contacts and interests and needs and wants to make the telephone a labor-saving device in the business of living, the telephone was installed. The Browns do not have a telephone because in their home the receiver would hang on its hook all day long undisturbed.

To think of the market for any article whatsoever in terms of 110 million people is futile. Advertise to those who understand your message and are responsive to an advertising and selling appeal. The telephone is the surest index of this market. One-third of the country's homes have telephones, and it is conservative to estimate that they buy two-thirds of the advertised commodities sold."

* * * *

In another broadside this publication—it is the Literary Digest—has this to say about the importance of the telephone:

"Old methods of finding and measuring the market for concentrated advertising effort are superseded by the telephone list.

The telephone list marks off from the total families in the United States the 8,419,668 homes with telephones.

These homes with telephones are something more than homes which can afford telephones. They are homes of families that need telephones, because the wider demands of their daily lives require this labor-saving device.

It is not the telephone, but what it stands for that makes these homes better markets. The telephone means greater social activity, greater buying power and a scale of living in which the telephone rent is negligible beside the help it affords. More than that, the telephone reveals a state of mind toward the community, a desire to keep in touch, a wish to know, which makes telephone subscribers receptive to sellers of worth while goods."

* * * *

These quotations are made to show telephone men that while to them the "daily grind" may sometimes get monotonous, the task of supplying telephone service is naturally important to the American people and a worth-while job for any man. It follows logically, of course, that the company which is constantly alert to improve its methods and serve the public well is the one that will win success.

Better management of telephone properties means better returns to everyone.

COMING CONVENTIONS.

Northern Indiana, Lake Wawasee, June 23, 24 and 25.

Pennsylvania, Western District, Conneaut Lake Park, July 23 and 24.

Indiana, Indianapolis, Claypool Hotel, September 23 and 24.

United States Independent Telephone Association, Chicago, Sherman Hotel, October 13-16.

Toll Traffic Management Problems

Excellent Presentation and Analysis of Some Every-Day Problems of Traffic Management as Encountered in Smaller Exchanges with Suggestions for Obtaining Desired Results—Address at Convention of New York Up-State Association

By E. J. Wagner,

Division Supervisor of Traffic, New York Telephone Co., Buffalo, N. Y.

The subject, "Traffic Cooperation," is a rather broad term and, perhaps, it is well to state that I have attempted to consider cooperation from the standpoint of service of such calibre that we will, in fact, be cooperating with the wishes of the public, and in turn will receive the public's cooperation.

In the various districts of the western division of the New York Telephone Co., the offices range in size from the one-position magneto board to fairly large-sized common battery boards, serving cities like Lockport, Niagara Falls, Binghamton and Elmira. While I have not had the pleasure of visiting many of your offices, it is my understanding that the territory which you people represent, has about the same conditions as to size of office and traffic problems that exist in the territory of the New York Telephone Co.

It is my wish to talk over with you various problems of traffic management, dwelling particularly upon toll traffic work, and we will all bear in mind that we are trying to talk about these matters, not from the large city office standpoint, but from the viewpoint of the offices in which we are daily working. In other words, in talking about the handling of toll traffic, we would like to get down to our every-day problems, find out what we ought to do with them, and then outline some definite means of obtaining the results we all want for our various offices.

The importance of the toll traffic problem is something which I believe cannot be too strongly emphasized; and furthermore, it is not a subject which we should regard as the concern chiefly of the great cities, with their large and complicated toll boards.

It may possibly be surprising, but it is nevertheless true that at least one quarter of all the toll calls handled in the state originate in what are commonly known as the smaller offices. For example, in the New York company, there were handled during last year 22,000,000 toll calls. Of this number, approximately 5½ millions were handled by the smaller toll centers. If the total from the connecting companies were included, the volume of traffic handled at the single-office cities would be, of course, greater than this.

You will agree with me, I think, that the handling of more than 5,000,000 toll calls a year is a real job, particularly if we are to handle this traffic in such a manner as to leave our subscribers not only satisfied but pleased and at the same time maintain a satisfactory balance between revenue and expense. But after all, is it

any different than the problems of any other type of business?

Granted that the telephone business is a unique and a technical one, it is also a common-sense business. The manufacturer offers a needed product to the public; the telephone company furnishes a necessary service to that same public; and both have the same end in view—to deliver their product satisfactorily and to earn a reasonable return on their investment.

Our job, therefore, is to handle this volume of toll traffic so that we shall please the public; to handle it so that we shall get all the revenue we are entitled to; to handle it economically and efficiently so that our expenses shall be such that a reasonable proportion of the revenue will be profit. In other words, we must in our every-day work keep constantly before us three fundamentals of the telephone business: Service, revenue and expense.

Bearing in mind then the thought that our job means giving the best possible service in the most economical way, let us consider some of the specific things that are meant by good service and the ways and means of accomplishing them.

We all know that a person who files a toll call expects us to be accurate and courteous. He demands a reasonable amount of speed in the handling of his call and above all, he expects us to make every effort to put him in touch with the party or number that he is calling. These are all reasonable demands on the subscriber's part, and it is at all times necessary for us to consider our business from the subscriber's viewpoint if we are to do our job well.

Our first contact with the subscriber, when he places a toll call, is through the recorder. It is right at this point that we go far towards making a satisfied or discontented subscriber. The recorder's answer must be prompt, for a subscriber does not understand—nor should he be expected to understand—why there is at times a delay in reaching the recorder.

It has been the experience of all of us, I am sure, when talking with subscribers, to occasionally have them say: "Well, I like your toll service first rate except for one thing—why do I have a delay in getting long distance?"

Some time ago we suddenly began to receive verbal complaints from an office where for years the company had enjoyed a splendid reputation for good service. The complaints were, as complaints often are, rather vague and indefinite, so I went over to the town and began to talk with the subscribers who were having trouble and found that the one thing that was bothering them was their delay in reaching the long distance operator.

Their local service was fine and the work on the toll calls after they were filed was satisfactory. There was just one thing—slow answers by the recorder. But that was enough to cause dissatisfaction with the service in general. It happened that this office was one where, due to the volume of toll business offered, each operator at the toll board handled all phases of toll work. (I am sure many of the offices represented here have the same problem.)

An investigation of conditions at the office showed that the number of operators provided to handle the traffic was adequate but there was not enough teamwork so that each of the toll operators would be constantly on the alert to answer re-

Awards in "Telephony's" Prize Article Competition

Executive or General Division:

First, Frank E. Bohn, Vice-President and General Manager, Home Telephone & Telegraph Co., Fort Wayne, Ind. Paper entitled, "The Functions of an Executive."

Second, Harry E. Eldridge, Commercial Superintendent, Suburban Division, Illinois Bell Telephone Co., Chicago. Paper entitled, "Supervision, Morale and Results, or Dealing with People."

Third, James C. Paxton, Southwestern Bell Telephone Co., St. Louis, Mo. Paper entitled, "The Unprofitable Small Exchange."

Commercial Division:

First, H. Colburn Allen, Commercial Superintendent, Puget Sound Telephone Co., Everett, Wash. Paper, "Collection Practice."

Second, Miss Marjorie Smith, Special Representative, Interstate Utilities Co., Spokane, Wash. Paper entitled, "Telephone Spongers."

Third, E. B. Scott, Commercial Department, Suburban Division, Illinois Bell Telephone Co., Chicago. Paper entitled, "Fundamentals for Efficient Collections."

Plant and Maintenance Division:

First, E. R. Hannibal, Superintendent, Interstate Utilities Co., Spokane, Wash. Paper entitled, "Practical Vision."

Second, C. A. Kee, New Brunswick Telephone Co., St. Johns, New Brunswick, Canada. Paper entitled, "Maintenance."

Third, Carleton Haven, Washington Telephone Co., Washington, Iowa. Paper entitled, "The Test Board Voltmeter."

Traffic Division:

First, Miss Bess Peterson, Chief Operator, Marshall Telephone Co., Marshalltown, Iowa. Paper entitled, "Efficient Management in the Operating Room."

Second, Miss Manta J. Elder, Chief Operator, Kansas Telephone Co., Ottawa, Kans. Paper entitled, "The Training of Operators and the Bulletin Board as a Source of Interest and Instruction."

Third, Miss Esther Dysard, Operator, La Porte Telephone Co., La Porte, Ind. Paper entitled, "Interesting Things in My Work."

Cash prizes were awarded in each division as follows: First $75, second $45, and third $30.

cording signals when the other was tied up; for example, on an out call. It was also found that the chief operator, who acted as supervisor, could frequently step in and record a ticket when both toll operators were busy.

A further step that is now being worked out as a means of obtaining quicker recording answers at smaller offices is to have person-to-person calls to nearby points recorded by the "A" operator who answers the subscriber. Such an experiment will be tried out at certain New York company offices beginning June 1 of this year.

The recording itself must be accurate, and by accuracy we mean attention to details while the subscriber is giving his call, correct filing time entry; in short, an earnest effort on the part of the recorder to prepare the ticket in such a way that the *out* operator will be able to readily understand what is wanted without annoying the subscriber by recalling him.

Care in entering the filing time exactly at the moment the calling party is dismissed is important, for to delay this step is to give a false impression of our speed of service and may lead the equipment people to believe that we do not need additional equipment at a time when we are actually running short. Poor work in this item may also lead the traffic supervisory people to believe that we are pushing our outward calls at the expense of inward and through service.

Other and important considerations in our efforts to render an accurate and dependable toll service are: Good directory and routing work, correct enunciation, attention to multiple markings and proper ringing. It may be well to consider in some detail one or two of these items, for example the directory and routing job. This part of our job, if done poorly, reacts both on the subscriber and the telephone company.

Careless directory work may mean a wrong number or a false *NF* report. Failure by the originating toll office to do directory work when it is possible means unwarranted delay in completing the call and unnecessary use of toll circuits.

It has been pretty well established by actual observation that from three to five minutes excess operating time is required to complete a call on which an information operator is reached at a city in which there are several exchanges. It is apparent, therefore, that it is much better for the originating office operator to spend a minute or less in doing directory work than to tie up both the call and a toll circuit for possibly five minutes on account of unnecessarily shifting to the distant office a job that should be done by the *OTC*.

In like manner a good routing job must be done by the originating office if we are to avoid poor transmission and circuit waste. By a good routing job is meant care in looking up the route and attention to passing the proper circuit code to all intermediate offices. These items, if kept in mind and acted on by the individual operators, will contribute much to furnishing the subscriber with an accurate grade of service.

In handling toll business, speed, as we said before, is a thing desired by the company as well as the public, because in addition to satisfying the public it allows for economical provision both of equipment and operators.

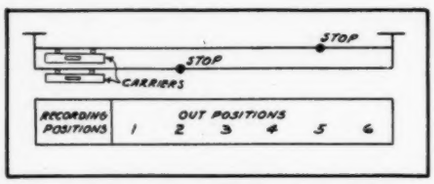


Fig. 1. Scheme for Efficient and Economical Toll Ticket Distribution.

The question of speed in toll service is of course relative; as regards the type of service we are talking about, for example, A-B toll service is by its nature faster than station-to-station or person-to-person service but, regardless of the type of service offered, there are certain common-sense rules which with but few exceptions must be applied to the handling of all calls if they are to be put up as fast as they should be.

Some of these factors involved in fast toll service are rapid recording, quick delivery of the ticket to the "out" position, efficient directory and routing work, definite assignment of traffic at switchboard, proper arrangement of tickets at switchboard positions, familiarity with ticket details before working out on a toll line, prompt ringing on a toll circuit after it is taken up, use of overlap ringing, ability to take action at once when it becomes necessary to reach a different station than the one called, use of overlap operations such as writing on tickets while proceeding with the call.

All of these points are, of course, covered in our toll operating practice in detail and it does not seem necessary to go over all of them again at this time. However, I believe it worth while to spend a few moments on one or two of the more important.

One of the real problems in giving fast service in the medium-sized office is the job of getting our tickets distributed promptly from the recorder to the line operator. Usually an office of this size does not warrant the use of a messenger and we have depended upon the supervisor to carry the new tickets from the recording positions to the line positions and also to pick up completed tickets and bring them to the position at which they are filed.

This arrangement is not entirely satisfactory, principally in the fact that it does not insure a regular even movement of tickets from the recorder to the line operator because the supervisor is often tied up with other duties while new tickets accumulate at the recording positions. With the thought of eliminating this unsatisfactory condition, traffic people have been trying to find something that would care for the problem of ticket distribution efficiently and economicaliy.

A device to accomplish this was recently made up by one of the western companies. It consists of strands of light wire supported by iron brackets, mounted at each end of the toll sections on the face of the board. Suspended from these wires by screw-eyes are small carriers, consisting of a block of wood on which a ticket clip is fastened.

The number of wires and carriers depends upon the number of outward positions which are to be served. For example, on a toll board having six outward positions, two wires will be adequate. A rubber stop would be attached to one wire opposite position No. 2 and another on the second wire opposite position No. 5, Fig. 1.

The operation is then very simple. The recorder selects the carrier which will reach the desired position at which the ticket should be handled, puts the ticket under the clip on the car and pushes it sufficiently hard so that it will coast to the stop. Any one of three operators can then reach the ticket. The line operators in like manner use it for returning tickets to the filing position.

The device is now in use on the Binghamton toll board and is proving very satisfactory. The cost is small, involving an outlay of but $10 for the material and labor. I believe that the use of such a means of distributing tickets will do much to improve our toll service as regards speed.

Two more factors in giving a pleasing grade of service to the public are courtesy and the completing of the call. Courtesy, as we all know, is a fundamental of the telephone business. For the traffic department it must begin with our answer to a line signal and must be in evidence at every step in the completion of a call. It is expressed in our tone of voice, in our interest in the call and, above all, in impressing on the subscriber that we are eager and pleased to satisfy his wants.

In regard to completing calls, we must bear in mind that a subscriber files a call with a definite idea of reaching his party and expects us to make all reasonable effort to complete it. The amount of traffic completed is also vitally related to the revenue of the company; in fact, it is one of the main features of toll work and as such it merits our constant consideration.

You all, I am sure, have heard much at past conferences about the summer slump in per cent completed toll traffic. Although much has been done to improve this condition, the problem is still with us and we

must be continually on the watch if we are to keep our summer service where it should be.

A particular feature of per cent completed that needs special attention is the work on Saturdays, Sundays and holidays. It is a fact that a large percentage of the toll traffic handled is offered on Saturday, Sunday and the ten observed holidays of the year. It is also true that our rates for service on these days are just the same as they are on weekdays.

There are no bargain days in the telephone business on which we might be excused for slower, poorer service. Therefore, it is up to us to see to it that our toll job is as good in July as it is in January and that our work on Saturdays and Sundays does not fall below the good service of the average business day.

The first point to consider in an effort to improve our Saturday and Sunday work is the development of an optimistic attitude towards this question. There has been too much inclination to say, "Well, it has always been hard to complete traffic on Sunday," and let it go at that.

True, it is more difficult to complete traffic on Sunday, particularly during the summer months, but if we apply the right methods we can keep our Sunday performance very close to the average month job, Fig. 2. It is necessary to use judgment on "subsequent attempts" on Sunday. For example, make subsequent attempts at times when it is reasonable to expect that people will have returned from church or an automobile ride.

The question of discipline and morale in an office on Saturday afternoons and Sundays is important. Every effort should be made to see that competent people are left in charge on these days. The big thing to remember is that a man expects to talk on his call, or he would not file it. And we should assume that he has reasonable assurance that the man he is calling will be home at some time on that day.

As an instance of the use of judgment in per cent completed I might cite a call that was filed some time ago at our Niagara Falls office. A man placed a call for Sutherland, Saskatchewan. When the ticket reached the directory and route operator, it was found that this place was not shown in the list of stations.

The man was called back by the directory operator and asked for further directions. All he could state was that the desired point was in the vicinity of Winnipeg and that he must have service as it was a call to notify his daughter of serious illness in the family. The call was then referred to the chief operator who decided to use common sense in the case and attempt to complete the call even though the called point was not listed.

The call was routed through Chicago-Milwaukee, which furnished connection to the desired office. The matter of rates was adjusted and the general result of this display of good judgment was a real service in an emergency and an exceptionally well-pleased subscriber.

So far we have tried to define what we mean by good service and have discussed methods of operating and use of equipment which, if followed, we believe will mean a good traffic job. But good service, with all that it means, does not just happen. Behind it must lie a very definite and carefully-executed program both with regard to equipment and the people who operate it. We have outlined things which we are convinced must be accomplished if our job as traffic people is to be well done. Now the next question is to find out how we are to do these things.

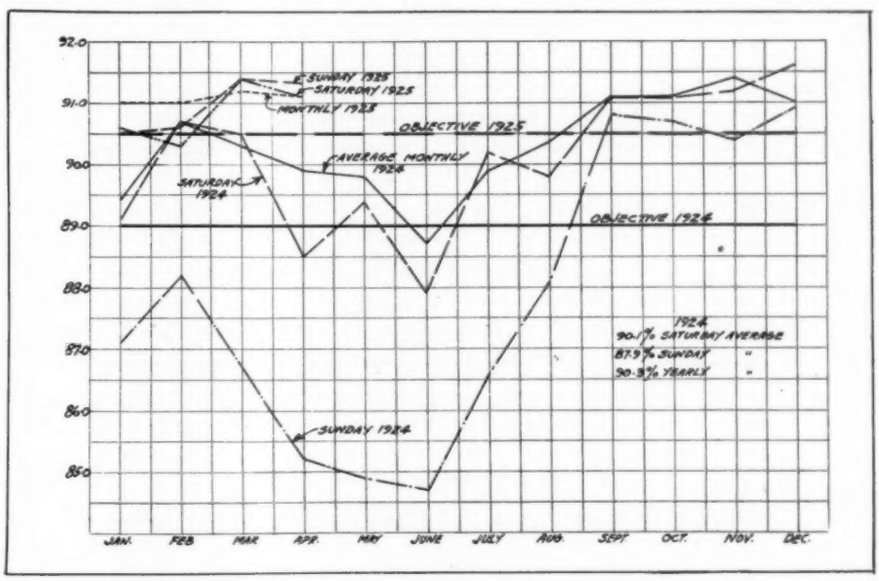


Fig. 2. Percentage of Completed Toll Traffic for Average Month Compared with Saturday and Sunday.

We spoke a moment ago of a definite program carefully worked out and exactly followed. What do we mean by this?

First of all, in handling traffic, whether it be local or toll, we must have a good idea of how much of it there will be to handle so that we can plan for our equipment and people accordingly, and we must make proper use of our equipment and our people. The fundamental base for doing this is the count of calls handled, generally known as the peg count. I am not in a position to know what kinds of records are maintained by your offices, but I assume that you are all keeping some record of the volume of traffic handled.

From these records, much information can be derived regarding the operation of the office. In the first place, the quantity and efficiency of the work turned out is measured by the number and kind of calls handled. Next, the number of operators required to handle the traffic of any office is obtained from the data which peg counts produce. Switchboard and other equipment requirements are also estimated by means of this peg-count data. From these facts it can be seen that peg counts play a very important part in the operation of a central office.

A short explanation of peg counts and force adjustment is that the work which is done by the operators is measured according to the kind of calls they are handling. For example, we will say that the simplest kind of a call is a local call from an individual line to another individual line in the same office. This call involves no particular difficulty either in locating the multiple jack or in ringing.

A call to a rural line means more work in the fact that the ringing will be much more complicated and because it is necessary to note carefully whether the particular party wanted has had his number changed or discontinued. Therefore, the count of calls is designed to indicate the amount of work performed as well as the number of calls handled.

It probably is not practical for all the offices represented here to maintain exactly the same kind of traffic records, but the point is this: That no matter how small the office, the management should know how much traffic is being handled, and from this be able to estimate for the future.

Records of calls are the traffic man's measuring stick, and no office that wants to do a good job can dispense with them. The most important use of these records is the provision of operators and equipment.

Force adjustment, or the economical and adequate provision of operating forces for each hour of the day, is dependent for its basic data on accurate peg-count records. Forecasts of the number of calls expected to be received at some future period are made from the trend of traffic obtained from peg counts and other sources, such as a daily count of our calls filed in toll offices, together with proper judgment of future business conditions.

The training of the people which these records indicate will be required should then be considered so as to engage students sufficiently in advance of the time needed that they will have had enough experience to enable them to satisfactorily handle the business received.

Training programs should be prepared at least three months in advance to the taking on of students. Great care should be exercised in preparing the program and it should be frequently checked so as to take into consideration any changes in estimates necessitated by business conditions or departures from the original program.

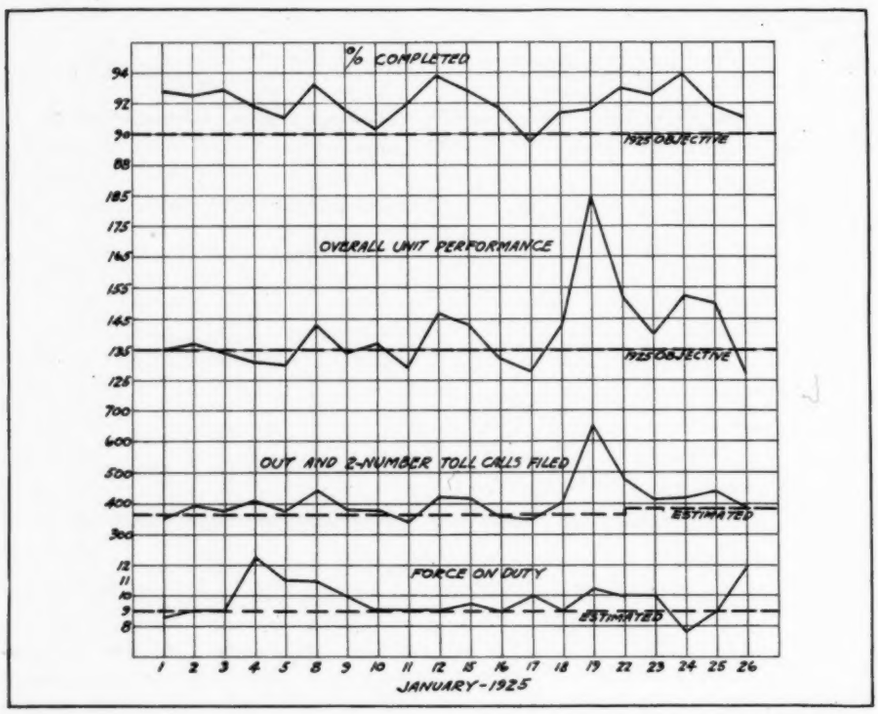


Fig. 3. A Month's Performance in Important Traffic Items Showing the Force Adjustment.

As an example of the use of a force adjustment in a definite office, Fig. 3 illustrates a month's performance in important traffic items. This example is an office scheduled to meet an objective load of 135 units under normal conditions, which can easily be raised to 145 or 150 overall load during abnormal traffic, such as storms, days preceding a holiday, etc.

The point I wish to make is that objective loads are based on average conditions and can easily be increased during rush periods without seriously hurting service. We strongly urge a constant check on the actual traffic, coefficient and force used as against the estimated items to get a true picture of how the force adjustment is meeting actual conditions.

Good traffic records allow us to plan well in advance for the people we need and to get them properly trained. After they are trained, they must be coached along and developed. This is one of the important elements of good service. A definite person should do this work in each office, and it should receive the close attention of the management.

Unless the manager, chief operator and supervisors are thoroughly familiar with the traffic problems and constantly instruct their subordinates, the quality of operating will soon fall off and poor service will result. In the larger offices at least, a supervisor should spend one-quarter of her time in coaching and instructing operators in the correct method of doing their work.

In addition to the actual furnishing of service, we are also delegated with a responsibility of determining what equipment is necessary and for placing the necessary orders for this equipment with either the plant department direct, or through a chief engineer.

You, of course, realize that most workmen, however skillful, cannot do a good job without tools; it, of course, follows that switchboard equipment, including both inside and outside plant, must be carefully planned out and provided in an adequate manner but with a view to economies in investment costs. In order to properly engineer or layout this equipment, it is necessary that records be furnished which shall be reliable and dependable.

In the preparation of switchboard schedules it is necessary to know what equipment will be required at all offices a reasonable time in advance—this for the purpose of arranging the necessary finances as well as providing the manufacturing organizations data so that they may properly arrange their manufacturing schedule. After this schedule has been completed, the actual preparation of orders for equipment take place.

In considering these orders, three things should always be given thought. They are:

1. Why do it?
2. Why do it now?
3. Why do it this way?

Providing equipment for a long period in advance of the time it will actually be needed presents the difficulty of accurately estimating the conditions at a distant future date, and brings up the question of interest on investment which will extend for some time. On the other hand, it is not wise to engineer on too short a period because this means more frequent annoyance to the operators and a chance that we will be short of equipment at times.

It is now a general practice to install major equipment jobs so that they will care for traffic for a period of about three years, this basis having been determined from a consideration of the foregoing and all other associated factors.

In the smaller offices it is often possible to make a real saving in investment by some short-cut; for example, when a small magneto board would require part of an additional position for only a few hours of the day during the busy season, the provision of a shelf with approximately six pairs of cords, ringing keys and ring-off drops would save the cost of a position installation.

As against providing a section of toll switchboard, provide a recording table. The relative cost figures are outstanding as a position of average low type of toll equipment would cost about $2,000, a standard recording board about a $1,000 per position, but a monitor type recording desk can be provided at a cost of approximately $375.

An installation of this type is highly desirable where overflow recording positions are necessary for only one or two hours of the day during the busy season only. In one office we have been able to put off the installation of any additional equipment by utilizing two positions of information desk equipment for overflow recording.

At smaller offices consideration should also be given to combining various kinds of work; for example, the possibility of combining recording, routing, directory and rate work on a special desk. It is our feeling for the smaller offices that no additional equipment should be recommended until very careful individual review has been made.

On the larger boards, both local and toll, careful studies and analyses of business should be made for the assignment of traffic to positions to keep a well-balanced board.

For most of the upstate offices, including a number of the connecting companies, the New York Telephone Co. has made toll line estimates in the past and that is, in general, the reason for asking for special records of toll business. The proper

amount of equipment to be provided as well as the provision of this equipment in an economical manner depend directly on the accuracy with which the special records are kept by the field.

The principal records which you have and will be asked to keep are what are known as the point-to-point records; in

OFFICE	NO. OF CALLS OBSERVED	AVERAGE TIME TO ANSWER & ACKNOWLEDGE EXPRESSED IN SECONDS	PERCENT OVER 20"
A	67	11	12
B	126	12	15
C	38	11	5.3
D	206	11	7.3
E	64	8.8	3.1
F	46	8.3	4.3

Fig. 4. Ring on Toll Line to Acknowledgment by Inward Office.

certain cases, jack counts which are nothing more or less than a count of the trunks in use each minute during the busy hour, records to show the distribution of traffic over the various hours of the day as well as to the various points, and some data on lengths of conversations.

In addition to providing proper equipment and the right number of well-instructed people, we must have a definite plan of checking upon performance. Every one who is engaged in any worthwhile thing—be it work or play—is anxious to know the results of his efforts, and this is likewise true of the telephone business.

The problem of systematically observing the quality of service rendered in the non-observed offices includes both the results of the chief operator's knowledge of daily conditions through constant contact, and whatever results may be supplemented from routine service observations taken in offices large enough to warrant an observing organization.

Local and toll service must be judged primarily in the central office by the chief operator monitoring from her desk on individual operators; or by observation on the floor, with the aid of a headset. Frequently, a chief operator is able to see an operator at work while listening-in from her desk, thus combining the two methods.

Such a method has positive value which must be recognized, and it should be part of a chief operator's daily routine to enable her to know what kind of service the force is giving, instead of waiting for a subscriber's complaint.

Figs. 4 and 5 are some charts showing the inward job at certain offices in my district. Chief operators of the non-observed toll offices have found these summaries helpful and interesting. They know at a glance how well their inward service compares with that of other offices.

We have also made up bulletins, which are posted conspicuously in the smaller offices, showing the monthly progress on each of these items. Objectives have been set, and figures greater than the objectives are shown in red.

It is a natural tendency that sometimes in a small office an operator or supervisor may say, "Well, we are only a small office; what difference does it make if we do not acknowledge our calls promptly, or if we do make a few mistakes in timing?"

The answer is that the toll traffic handled in the small towns, where there are no observing bureaus, comprises about 50 per cent of the total business handled. How important then that the small offices should line up with the big toll centers in doing a job that is satisfactory to the company, and pleasing to the subscriber.

At this point I want you to know that we must not forget that we cannot expect our operators to do a good job unless the equipment is right. There should be in every office a daily routine of testing the toll lines, ringing equipment, line and ring-off drops, etc. The conditions of the cords and multiple markings should be checked, and there should be a definite method of getting these troubles promptly cleared by the plant department.

Granting that all these things we have talked about are good, there may be a question as to whether they can be done economically; in other words, can we do them and keep out of the red?

I believe that if we follow these methods in a common-sense fashion we can do it. If we are watchful to see that we have the correct number of operators and supervisors and that they function properly, we will find that much more business can be handled without extra expense for equipment.

Above all, it is essential that we secure all of the revenue we are entitled to by a high per cent completed toll traffic throughout the year—by accurate timing and, particularly, by good work on toll calls from and to coin boxes.

This latter point—the securing of revenue at coin boxes—is one which I believe worthy of special mention. No doubt, at all accounting centers many tickets covering calls from coin boxes are received without indications of money having been collected—whether the money is actually collected or not cannot be ascertained, but so far as the accounting people are concerned, the tickets mean lost revenue.

A study of the situation has shown that in a large number of cases the recorder fails to enter the code for a coin box on the ticket; although in other instances, the failure to indicate collection is squarely up to the line operator. One of the steps that can be taken to remedy this situation is to encircle all coin-box jacks with white paint instead of relying on the standard marking, which has been a small white dot under the jack.

The purpose of changing the coin-box multiple marking is to focus the operator's attention on it when she is recording an out call or completing an in-collect call.

In addition to these changes the entire matter of coin-box work should be given close attention by managers, chief operators and supervisors; the supervisors frequently picking up the tickets to see if collection has been made and taking up failures to collect with the individual operators as near the time of occurrence as possible.

The result of these efforts will no doubt be a marked reduction in the number of tickets covering calls from coin boxes which show no collection.

We have seen that a good traffic job—either local or toll—is based on sound principles of an adequate and well-trained force, proper equipment and a common-sense use of both. We have analyzed toll service, particularly from the standpoint of accuracy, speed, courtesy and per cent completed. We have looked at the equipment and operating problems in detail and have discussed various ways and means of meeting these problems.

The big thing now is for us to be sincere in our application of these methods if we want them to succeed. Unless the management has a feeling deep down inside that there are certain definite things to be done, we can never hope to convince the people whom we want to execute our ideas that we are right. And we must keep in mind that the success of our job as traffic people depends to no small extent upon our ability to cooperate with the plant and commercial departments.

The practical traffic man is continually on the alert to cooperate with other departments and is not letting many opportunities slip away to point out congested line conditions, abuse of flat rate service, possibility of extension sales. In like manner he is not hesitant in asking for prompt attention to equipment troubles and manifests cooperation in this by pointing out,

OFFICE	NO. OF CALLS OBSERVED	AVERAGE TIME FOR CALLED STATION TO ANSWER EXPRESSED IN SECONDS	PERCENT OVER 30"
A	12	17	17
B	27	17	15
C	24	25	4.2
D	30	26	3.3
E	19	9.7	0.0
F	40	13.	5.0

Fig. 5. Acknowledgment of Inward Office to Answer by Called Station.

if necessary, the reasons behind his requests.

The telephone business today is complicated and of such proportions that it demands the best that is in all of us. Frequent checks of our own individual performances are in order so that we will be of real assistance to the people working

with us. Our business is a 24-hour business, 365 days in the year. There are no cut-rate days and bargain sales. We advertise continuous service at all times at standard rates. The switchboards are our showcases, and they must be at all times well-stocked with courteous, accurate and prompt service, so delivered that we shall make a fair return for the company.

In order to obtain these results, the biggest factor is a plain common-sense attitude towards our daily work. Put your hearts into the business, give the right kind of service, and it will bring you peace of mind and happiness. Above all, if you can sell this attitude to the individual in every office, good service and contentment of force will be the result; and dissatisfaction and complaint, both from the public and within our own organization, will be reduced to a minimum.

Southwestern District Conference

Class A, B and C Member Companies of United States Independent Telephone Association in Southwestern District Gather at Kansas City and Dallas—Analysis Made of Methods of Distributing Depreciation and Maintenance Expenses

In its plan of organizing its member companies for closer cooperation, particularly in connection with uniform accounting practices, the United States Independent Telephone Association has designated Missouri, Kansas, Oklahoma, Arkansas and Texas as its Southwestern district. On account of the large territory covered by this district it was decided to hold two conferences of the A, B and C class companies—one at Kansas City, Mo., June 9 and 10, and one at Dallas, Texas, June 11 and 12.

The Kansas City conference was held at the Baltimore Hotel with an attendance of 16. To it were especially invited the A, B and C class companies of Kansas and Missouri, and the presidents and secretaries of the state associations of that district. To this invitation only one company failed to respond by sending a representative.

The state associations were represented by President Youmans and Secretary Kraege of Kansas, Secretary Hedrick of Missouri and Telephone Engineer Hubenthal of Oklahoma. W. L. Lemon of Lincoln, Neb., chairman of the Northwestern district accounting section and R. F. Wilder, of the Tri-State Telephone & Telegraph Co., St. Paul, Minn., assisted in the program and discussions.

As at the Northwestern district conference, held in Des Moines, Iowa, June 3 and 4, the larger part of the three sessions of the conference was devoted to an analysis of the depreciation and maintenance accounts of the companies and to an explanation and discussion of the units proposed by the Class A companies to be used in defining the dividing line between depreciation and maintenance. This list of units was approved by the conference with a recommendation that the list, with such amendments as may be found advisable as a result of the conferences' discussions, be submitted to the association members at the annual convention in October.

At the Dallas, Texas, conference the attendance was 24, only one company being absent. President Youmans and Secretary Kraege of Kansas, and Telephone Engineer Hubenthal of Oklahoma, also attended this conference which was held at the Hotel Adolphus. The Texas association was represented by President Still and Secretary Gardner.

The Texas conference voted in favor of the principle of agreeing upon a list of property units to be used in establishing a dividing line between depreciation and maintenance but suggested that the units as presented by the A class companies are not applicable to the smaller companies and should be revised to meet the needs of all companies.

	1916	1924	Percentage Increase in Telephones
Percentage for interest and dividends	7.2	8.4	1916-24- 25.8
Percentage for capital stock	11.2	13.5	1922-23-(d) 2.8
Interest to funded debt.	6.1	6.5	1923-24- 4.5
Depreciation to fixed capital	3.6	5.3	

	Gain in Telephones in 1923-1924 Per Cent	Available for Interest and Dividends 1924 Per Cent	Depreciation Rate, 1924 Per Cent
A class companies	8.3	7.5	5.2
B class companies	4.7	9.8	5.3
C class companies	2.7	5.1	5.5

Results of Operations of Class A, B and C Companies in Southwestern District.

This conference also voted to request the national association to take up with the Interstate Commerce Commission a further reclassification of the telephone companies so that the division between A and B class companies should be set at a figure much higher than the one now used, which is $250,000 annual receipts from operations.

Both conferences were presided over by President F. B. MacKinnon. The accounting questions were presented by V. E. Chaney, of Theodore Gary & Co., Kansas City, Mo., who has been selected to act as chairman of the accounting section of the Southwestern district. As at the Northwestern conference, each company's method of distributing depreciation and maintenance expense was analyzed. Differences in operating results due to different accounting practices were pointed out.

Throughout the conferences emphasis was placed on the necessity for uniformity if there is to be any general cooperation in financing of Independent companies.

The summary of operating data for the companies of this district will be published in TELEPHONY later. The percentage results of operations of the two A, nine B, and six C class companies of the district as presented to the conferences are presented on this page.

As at the Northwestern district conferences, those who attended these Southwestern conferences were unanimous in expressing the opinion that the conferences are the most constructive work that has been done by the national association in years and pledged the support of the state associations in carrying the information and discussions to the D class companies.

The companies whose statistics were presented at the two conferences were:

A Class Companies:

West Texas Telephone Co., Brownwood.
Kansas City Long Distance Telephone Co., Kansas City, Mo.

B Class Companies:

Gulf States Telephone Co., Tyler, Texas.
Two States Telephone Co., Texarkana, Texas.
Long Distance Telephone Co. of Texas, Waco, Texas.
San Angelo Telephone Co., San Angelo, Texas.
Haskell Telephone Co., Haskell, Texas.
Cape Girardeau Bell Telephone Co., Cape Girardeau, Mo.
Columbia Telephone Co., Columbia, Mo.
Grayson Telephone Co., Sherman, Texas.
Greenville Telephone Co., Greenville, Texas.

C Class Companies:

Northeast Kansas Telephone Co., Hiawatha, Kans.
Del Rio & Western Telephone Co., Del Rio, Texas.
The Missouri Union Telephone Co., Clinton, Mo.
The Galena Home Telephone Co., Galena, Kans.
The Junction City Telephone Co., Junction City, Kans.
Capital Telephone Co., Jefferson City, Mo.
The Johnson County Home Telephone Co., Warrensburg, Mo.

The next district conference of the A, B and C class member companies of the United States Independent Telephone Association will be that of the central district at the Edgewater Beach Hotel, Chicago, Thursday and Friday, July 16 and 17. At this conference the Class A, B and C companies of Wisconsin, Illinois, Indiana and Michigan will be represented.

Safety Methods in Telephone Work

Second of a Series of Articles on Safety Methods in Telephone Maintenance Work—Safety Factors to be Considered in Constructing Pole Lines and Aerial Plant; Importance of Competent Foreman With Interest in Welfare of His Men

By A. W. Hill

In constructing pole lines and aerial plant we must consider safe methods in the manner of working to avoid injury at the time of such construction, both to those engaged in the actual work and to the public, and also take into consideration anything that may make for a future hazard.

From the time lines are surveyed and staked out for pole locations, and the poles are delivered at the stakes, the liability to accidents commences. Poles should not be delivered along streets and highways in such positions that they may roll, or be pushed down an embankment or grade, onto a sidewalk or highway where some one may be struck by them or fall over them or run into them with a machine, thereby causing serious results.

Such cases may seem on the face of it far-fetched. Yet they have, and still do, actually happen—and the company to whom the poles were delivered is solely responsible for any incurred damage. Care should be exercised that persons delivering poles that are not to be placed immediately, are cautioned not to place them on any embankment or declivity where there is a possibility of them rolling, without blocking or otherwise making them secure. This likewise applies to either full or empty cable or messenger strand reels or any object that will roll.

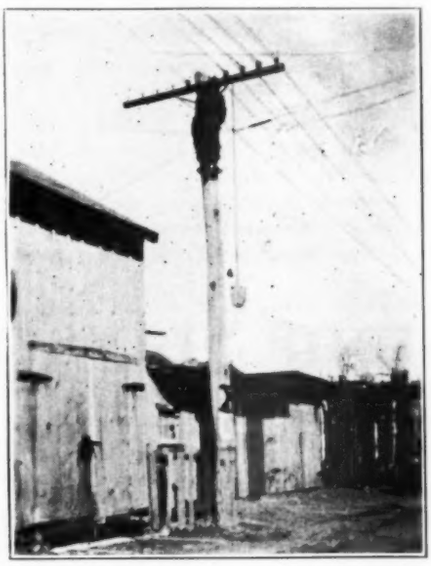
Pole or anchor holes that are dug any length of time prior to placing the poles or anchors should be well-protected by boards or planking, if in a locality where there is any liability of anyone falling into them and red lights should guard them at night.

In digging holes in certain localities, especially in mountainous districts, it becomes necessary to use dynamite. The building of this explosive should only be entrusted to one accustomed to its use and bearing a license to use it. If the telephone company handling the construction does not have an employe known to be perfectly competent to handle high explosives—and the majority do not—an expert should be hired to handle that portion of the work.

If necessary to transport dynamite, in case the company is in position to do its own blasting, it should be carried in a padded container so that the liability of a severe jar and accidental explosion will be avoided.

Coming to the actual erection of the pole line, the first consideration, naturally, is to have sufficient men to erect the poles. If they are to be piked in by hand—and in the majority of cases they will be, as a heavy truck with power winch and derrick is usually an unwarranted outlay for a company whose construction is not exceptionally great—insufficient man-power means two distinct hazards.

One is that of over-lifting, causing serious personal injury to someone, or the chance of one man slipping or falling under the overload, thereby causing sudden extra weight to come on the others, with the result that the pole falls with more or less serious results. Then, too, where a pole is set short-handed, there is a chance that the use of canthooks will be omitted, allowing the pole to turn suddenly, with the result that the pike-pole spuds are turned out.



Using Canvas Bag to Raise and Lower Material.

Setting poles without canthooks, and with makeshift deadmen, is too often common practice; in some cases a digging bar is even substituted in the absence of a deadman. Such practices are to be absolutely condemned. Better to leave the work go until it can be done properly than to allow it to progress in a slipshod, short-handed way to the serious or possible fatal injury to the workmen.

Extreme care should be taken, in places where it is necessary to pike poles up through electric light and power wires, that the pole does not catch on, or swing into, any of the wires and break them down. Rubber gloves covered with horsehide ones should be worn by each man engaged on work of this kind when the poles and tools have become water-soaked. The leakage down a wet pole or pike pole in extremely wet weather is often sufficient, if the voltage be 2,200 or over, to at least disturb the co-ordinated lifting to such an extent as to cause an accident.

Groundmen should avoid working underneath poles on which anyone is working, and they should not permit any pedestrian to walk under them. The throwing of tools and material from the ground to a lineman working on a pole is a dangerous practice and should not be permitted. All such material should be raised and lowered on a hand line.

For small items of material, such as insulators, pins, lag bolts, etc., they should be placed in some type of collapsible canvas bucket and pulled up on the line. Handline and pulleys used to raise crossarms and other heavy material should be examined before using to make certain they are in proper condition to carry the load.

In placing glass insulators, any that are badly chipped or cracked should be discarded. In replacing insulators where part of the old one remains on the pin, extreme caution should be used to prevent getting out.

All wires and drop loops crossing streets and highways should be kept sufficiently high to clear the top of any loaded vehicle that may have occasion to pass under them; they should, in no case, be less than 18 feet from the crown of the road. Wires carried over railroads should clear the top of the rail at least 30 feet. Serious accidents to trainmen on the top of cars have resulted from lack of observance of this clearance.

Guy wires and anchor rods should be placed so that they are not liable to be struck by machines. In the case of guy wires passing over pavements and sidewalks, the clearance should never be less than eight feet.

In running wire across highways and street intersections, such locations should be carefully guarded that traffic is not obstructed or the public rendered liable to accident.

Where it is necessary to run wire over trolley contact wires, or in close proximity to electric light or power wires, each workman should be equipped with rubber gloves and overshoes and horsehide gloves; par-

ticular care should be taken that the man tending the reel is so equipped.

Care should be taken that the wires are kept taut at all times between the reel and running board. Where it is possible to keep wires being run from sagging down on current-carrying wires, a running line with rope loops on eight or ten-foot spacing attached to it should be drawn tightly between poles and the running line, and the wires pulled through these loops and held until they are pulled up and permanently tied in place.

Where it is necessary for a man to work in very close proximity to power or light wires, someone should be stationed on the ground to watch his movements and give warning should he inadvertently get too close to them.

These methods may seem tedious and lower the gang efficiency, insofar as work units are concerned, but it is far better to use the precautions and slow up the job a little temporarily than to hurry and have fatal accidents.

Poles being transported from place to place on pole dinkeys or trucks should be firmly secured. Care should be taken, in passing other vehicles or turning corners, that they do not suddenly swing around and strike anybody or anything nearby.

Old Pole Lashed to New While Being Transferred.

Poles that have deteriorated and require replacement should be securely guyed before being dismantled and the wires and fixtures transferred to the new pole. If the new pole is located close to the old one, the latter may be securely lashed to it until dismantled. If no other pole is convenient for lashing it to, it may be supported by four pike poles placed so that the strain is equally distributed and each pike well-founded and guarded by a man. If the pole is over 30 feet in height, the pike method becomes unsafe and some method of temporary guying must be resorted to.

Where only a small force of men is employed, and particularly where some of them are temporary labor procured for a short period and not skilled in the work, it is good policy to do all replacement work possible with ropes and blocks, pulling them up by hand, team or machine, according to the means available.

All the foregoing items, if strictly observed, make for as reasonably safe construction work as can be expected. Of course, too much stress cannot be placed on the type of foreman. Safety methods may be talked over and instructions given on them, but to make absolutely sure that they are adhered to it is vitally important that the foreman be perfectly competent to handle any job in a thoroughly safe manner and that he has a whole-hearted interest in the welfare of his men every hour of the day.

Georgia System Stays Independent

Properties of Consolidated Company of Moultrie, Ga., Purchased at Receiver's Sale by James L. Kirk, of Arcadia, Fla., After Spirited Bidding—Southern Bell's Higher Bid Was Disregarded Because of Its Being Conditional

James L. Kirk, of Arcadia, Fla., has purchased at receiver's sale for the sum of $85,000 the properties of the Consolidated Telephone & Telegraph Co., of Moultrie, Ga., which operates common battery exchanges at Moultrie and Boston and magneto exchanges at Barwick, Coolidge, Ellenton, Doerun, Lens, Morven, Newton, Norman Park, Pavo, Sale City and Whigham, Ga.

The sale was made through W. A. Pringle, who has been receiver for the properties during the past four years and was approved by Judge W. E. Thomas of the superior court in Thomasville at a hearing on June 1. Mr. Kirk's bid was $1,000 lower than the highest bid—that of the Southern Bell Tel. & Teleg. Co.

In approving the lower offer of Mr. Kirk, the court called attention to the fact that the bid made by the Bell people necessarily was conditional, in that approval of the sale by both the Georgia Public Service Commission and the Interstate Commerce Commission would have to be secured before the transfer could be made. That such approval would be opposed by the Independents was admitted and even if such opposition failed it would serve to delay matters. In view of these factors, it was explained by the court that it was felt the acceptance of Mr. Kirk's bid would be in the interest of the stockholders.

Mr. Kirk started negotiations for the purchase of the property and franchise of the Consolidated company several weeks ago and on the basis of his offer of $70,000 for it, Receiver Pringle petitioned the court to sell. This permission was tentatively granted, but the Southern Bell, as one of the creditors of the Consolidated, intervened and made a bid of $80,000. This resulted in the hearing before Judge Thomas at Thomasville on June 1.

When the hearing had been called to order Mr. Kirk raised his bid to $82,000, whereupon the Bell representatives raised their bid to $83,000. Mr. Kirk raised his bid to $85,000, which he said was the last cent he would offer. The Bell's bid was promptly raised to $86,000.

The Bell representatives had read before the judge a resolution passed by the chamber of commerce of Moultrie to the effect that the sale of the properties to the Southern Bell would be satisfactory.

Attorney Wilcox, of Valdosta, representing Mr. Kirk, upon the presentation of the Bell's bid for $86,000, read letters from W. C. Vereen, president of the chamber of commerce of Moultrie, and H. I. Ashburn, mayor of the town, stating that they had no objections to the property being sold to private parties provided they were willing to improve the service. They expressed confidence in Mr. Kirk's ability along that line and did not feel that the resolutions in behalf of the Southern Bell were intended to convey opposition to any other capable purchaser.

Judge Thomas then rendered his decision in favor of the unconditional bid, the Southern Bell having refused to allow the forfeit of its $8,000 cash payment in the event the conditions were not met, which Mr. Beck, the official present, said he was not authorized to do in that respect, as it was a matter entirely without their control.

The sale ends a four-year receivership, which has been conducted by the court for the purpose of securing an adequate bidder for the property, as well as conducting its affairs during the time of its insolvency. The debts against the company will amount to approximately $60,000. It is expected that the stockholders will receive about $10 per share when the final liquidation is accomplished.

Mr. Kirk is a telephone man of wide experience, having been in the business practically all of his life. He is to be congratulated upon his success in securing control of these properties, as is also the Independent group of the industry.

Radio from Listener's Standpoint

Comprehensive Discussion of Radio in Its Many Phases—Interference to Radio Reception—Receiving Set Features—Address Presented at Annual Conventions of Kansas and Pennsylvania Associations—Second Installment

By Ray H. Manson,
Chief Engineer, Stromberg-Carlson Telephone Mfg. Co.

If it were not for interference of various kinds, the broadcast problem would be a simple one and the owner of a receiving set could easily tune in any station within the range of power of the broadcast station.

Under the heading of interference can be listed everything that prevents or interferes with the obtaining of clear, faithful reproduction in the head set or loudspeaker of the program that is being received at the microphone in the broadcast station. Several prominent sources of interference are listed in the table, Fig. 8.

The amount of interference received from these various sources, differs according to the locality of the receiving set and to certain facts regarding the time and nature of the broadcast. For example, the United States Bureau of Standards conducted a test with a picked number of observers located at different radii up to 400 miles from two important broadcast stations, the results being as listed in the table, Fig. 9.

No doubt, the best conditions for determining the importance of various kinds of interference was that presented by the International Broadcast Tests which were conducted by Radio Broadcast magazine last fall. The table, Fig. 10, shows data taken from written reports received by this magazine. The importance of eliminating the radiating receiver is emphasized by the fact that one-half of the interference to the successful receiving of the distant European stations, was due to this source alone.

It is recognized that the future success of radio depends upon what is done about the problem of interference. The public should be taught to distinguish between *removable* interference and *inevitable* interference, and to know what to expect in various locations and under various conditions.

It is evident that broadcast stations in the class B list can have the programs so scheduled, and the separation in kilocycles wide enough, that little or no interference should exist between programs. An attempt was made to cut down the separation to seven kilocycles, but the interference was increased so that 10 kilocycles has been made standard for the time being. It would be much better if this separation was increased to 15 kilocycles, as it would then prevent overlapping of powerful local broadcast station signals.

There is no possibility that interference can be prevented between the large number of stations working simultaneously on the class A wave lengths. Theoretically, stations in this classification should not have a range of over 25 to 50 miles, but many of these stations are high-powered, up to 500 watts, and under favorable condition, even the smaller stations can be picked up by receiving sets through long distances.

SOURCE OF WORST INTERFERENCE 'Radio Broadcast' TEST	
Radiating Receivers	50.7 %
Spark Stations (Code)	18.5 %
Static	13.5 %
Fading	5.3 %
Other Stations	5.3 %
Man-made Static	5.2 %
No Interference	1.5 %

Fig. 10. Source of Worst Interference, from "Radio Broadcast" Magazine Test.

Thus, we can dismiss from consideration the removing of interference between class A stations, and the broadcast listener must be content to listen only to programs from very nearby local stations in the class A list. It is true that occasionally distant class A stations can be picked up free from interference, but it is this uncertainty that makes radio so interesting to the average listener.

The interference from amateur and commercial telegraph stations has been cut down to the point where it is not a limiting factor and in time will gradually disappear from this interference list.

The matter of interference from radiating receivers is extremely serious, as it is humanly impossible to teach over a million users of these sets how to operate without causing serious disturbances in the programs of neighboring broadcast listeners.

It is hopeful to note, however, that most of the modern broadcast receiving sets are so designed that no radiation can take place from the receiving set antenna, regardless of how the dials or other controls are manipulated by the listener. Radiating types of receivers should be barred from the market.

Possibly the most difficult interference to overcome is what is known as "static," which can be natural atmospheric electrical discharges or a combination of disturbances from local electrically-operated equipment. The natural or atmospheric static varies during the seasons of the year and it is impossible to predict as to what any one evening may develop in the way of this kind of interference. It is as uncertain as the weather and we only know that it is more prevalent in summer time than in winter.

If we analyze the situation, it will be

1—Cross Talk: Caused by broadcast stations working on wave lengths (frequencies) too close together. More than one program is heard.

2—Beat Notes: Due to more than one broadcast station operating on same wave length. Steady "whistling" note is heard.

3—Radiating Receivers: Oscillating receiving sets, sending out radio frequencies that cause "beat notes" of fairly steady or varying pitch. High pitched "squeals" or low "groans" are heard.

4—Telegraph Code: Caused by amateur spark sets and A. C. tube sets or by commercial telegraph stations. Familiar telegraph code is overheard.

5—Static: Natural atmospheric discharges or man-made electrical disturbances of same order of frequencies as that of broadcast stations. Continuous "noise" or heavy "crashes" are heard.

6—Fading: Interference to uniform or steady strength of signal. Program gradually becomes weak or disappears and returns without retuning receiver.

Fig. 8. List of Various Kinds of Radio Interference.

Results of Interference Test Conducted by U. S. Bureau of Standards.

Kind of Interference	Percentage of Times Heard
Other broadcast stations	32
Atmospheric (static)	18
Fading	13
Amateur transmitting stations	6
Radiating receivers	5
No interference	23

Fig. 9. Interference from Various Sources, Bureau of Standards Report.

STROWGER AUTA

IT IS morning pho
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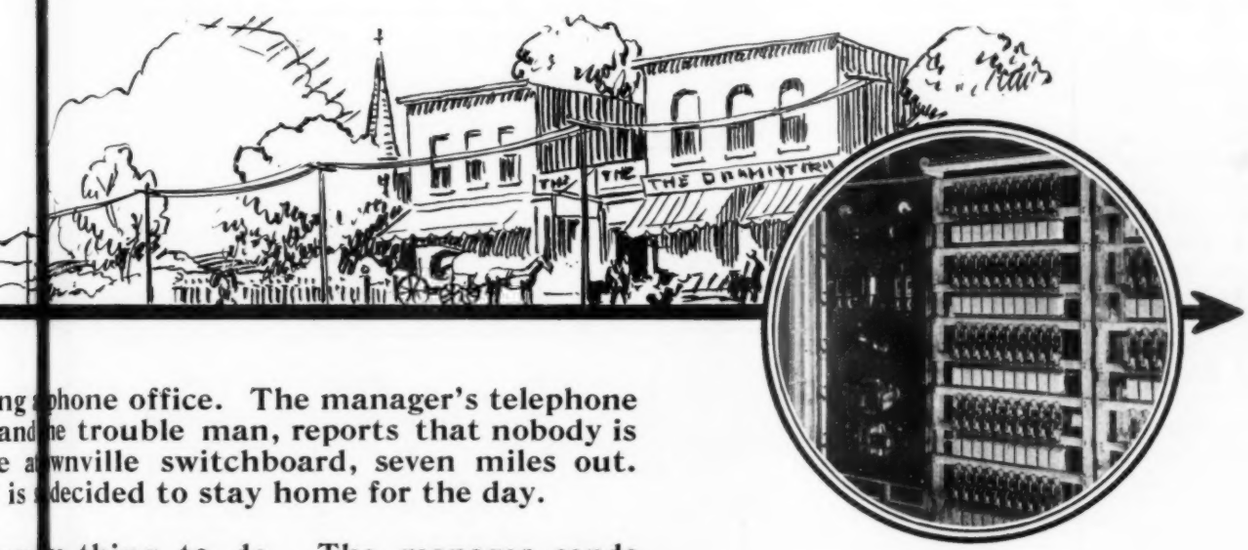
TATIC SATELLITES



ng phone office. The manager's telephone and he trouble man, reports that nobody is e at wnville switchboard, seven miles out. is decided to stay home for the day.

ere he thing to do. The manager sends mai perators out to tend the switchboard, xpe and back. In the meantime, Brown= ers rent telephone service or none at all, ne te main office operating force is still ed.

Au Satellite avoids such troubles because it erat ner regular attendants. Installed in now small manual boards or heavily loaded tu properties into revenue producers, and nage the company from much of the burden hat yment of operators entails.

THE Strowger Automatic Satellite is a complete automatic operating unit connected by means of trunks to the parent exchange, which may be either automatic or manual, and providing facilities so that local subscribers desiring services that require human attention, such as long distance, information, etc., can reach an operator in the parent exchange by dialing a designated number.

Adapted to your particular needs, the Strowger Automatic Satellite will:

Render modern automatic service to your subscribers in outlying districts.

Make supervision easier.

Meet completely every traffic and service requirement in outlying exchanges.

Save dry cell renewal expense.

Eliminate all operator expense for outlying exchanges.

Make possible a gradual conversion of your property to Strowger Automatic, without heavy initial investment.

to Electric Company

Fac neral Offices: Chicago, Illinois

CIATED COMPANIES

ional and Engineering Corporation.....New York
ional phone Company, Ltd.....London
tic T Ltd.....Liverpool
nle F xploitation des Procédés Thomson-Houston...Paris

1—Sensitivity: Ability to amplify extremely weak signals (Distance).
2—Selectivity: Ability to separate stations on close wave lengths.
3—Tone Quality: The faithful reproduction of the audio frequencies.
4—Signal Volume: Producing of full loud-speaker reproduction.
5—Simplicity of Operation: Use of few controls and no interdependent controls.
6—Reliability: Ability to withstand hard service and adverse climatic conditions.
7—First Cost: To be consistent with good operation and reliability.
8—Cost of Operation: Cost of current supply, tube replacements and repairs or servicing.
9—Ease of Installation: Outside wiring and locating of accessories.
10—Manufacturer's Responsibility: Commercial and financial standing of make and possibility of getting repair parts in future.

Fig. 12. List of Receiving Set Features.

found that any interfering noise is a source of annoyance only when this notice becomes the predominating factor. The diagram, Fig. 11, shows a varying noise (static) level during a selected period of time.

If the signals from a distant broadcast station are of greater magnitude than the noise level, as shown by the line *A*, then only occasional crashes of static will interfere, as shown at *X* and *Y*. On the other hand, if the signal from a distant station is not so powerful as indicated by the line *B*, then there will be more interference from the static. Finally, if the signal from the distant station is weaker than the average of the atmospheric disturbances, as shown by line *C*, the program will not be intelligible.

With the foregoing in mind, in order to avoid "static" interference, it is either necessary for us to be content to receive programs from stations that are not too far distant, so as to keep the strength of signal above the static level, or that the broadcast stations use increased power, so that the received signal from the distant stations will be above the static level.

The increase of power in broadcast stations is now being tried out in the so-called "super-power" stations; and if this greater power does not introduce other troubles, such as overlapping of programs or inability to tune out the powerful stations when stations on nearby wave lengths are desired, then gradual increases in power will be adopted.

Very little can be done by the broadcast listener to overcome these various forms of "static" interferences. Of course, the more modern radio receiving sets are so designed that maximum selectivity (the ability to tune out everything except a 10-kilocycle band for distant stations) can be obtained.

It has been suggested that the providing of sufficient radio-frequency amplification in the receiver, to allow small sizes of antennas or loops for picking up the broadcast signals, will decrease the ratio of the static signal to the desired signal. Carefully shielded sets show that this plan does not work out in practice, if the loudspeaker volume is kept the same in each case.

Various arrangements of antennas, directional loops, and the use of antenna wires buried beneath the earth have been proposed as means for overcoming some of the effects of static in the receiving set.

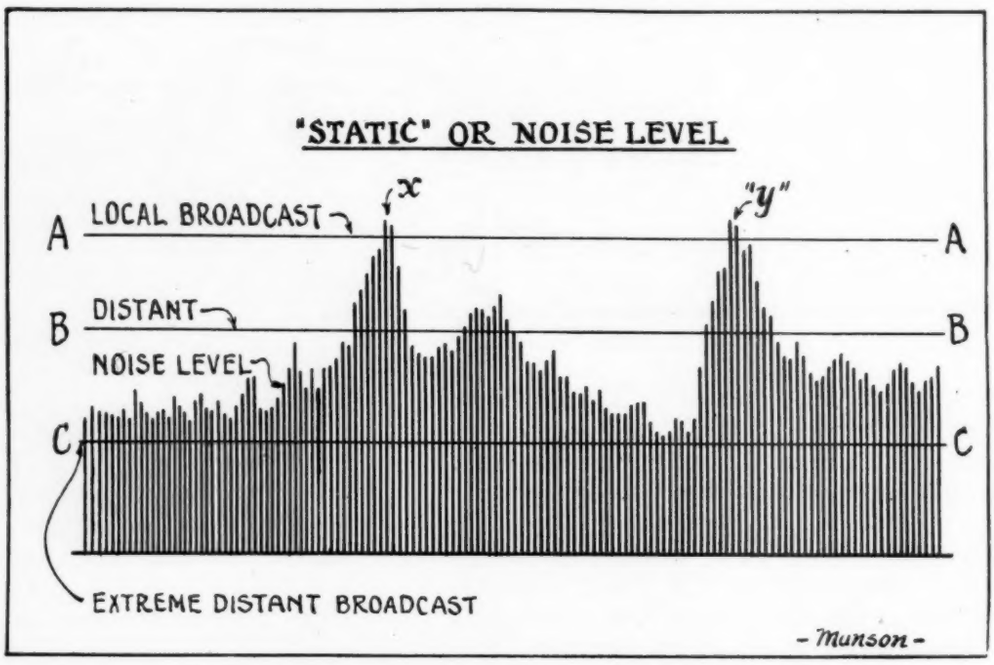


Fig. 11. "Static," or Noise Level, with Respect to "Signal Level."

Fundamentally the purpose of a radio receiving set, for broadcast reception, is to deliver to the user a complete and faithful reproduction of the program that is being produced in the studio and being broadcast by any selected station.

Radio Receiving Set Features.

At the start, the radio public was satisfied to be able to recognize a distant station and cared very little for the faithfulness of reproduction. Today, the demand is for a receiving set that will bring in a distant station and give a faithful reproduction of what is going into the microphone at that station.

If we omit the matter of interference, then the ability of the broadcast receiver to pick up and amplify a signal is dependent on whether the electrical waves from the distant station reach the receiving set antenna. Obviously, it would be impossible for the receiver to amplify the signal if it

1—Crystal Receivers: Uses crystal detector and no batteries.
2—Regenerative Receivers:
  (a) Single tube amplifier and detector system.
  (b) Regeneration also used with following receivers to reduce number of tubes.
3—Un-Tuned Radio Frequency Receivers:
  (a) Several fixed stages of radio frequency amplification.
  (b) Also reflexed to reduce number of tubes in receiver.
4—Tuned Radio Frequency Receivers:
  (a) All radio stages tuned to frequency of incoming signal.
  (b) In best form, neutralized against tube feed back (Neutrodyne).
  (c) Also reflexed to reduce number of tubes in receivers.
5—Super-Heterodyne Receivers:
  Employs a frequency lower than that of incoming signal to allow fixed radio frequency amplifiers to be used efficiently.

Fig. 13. List of Types of Radio Receiving Sets.

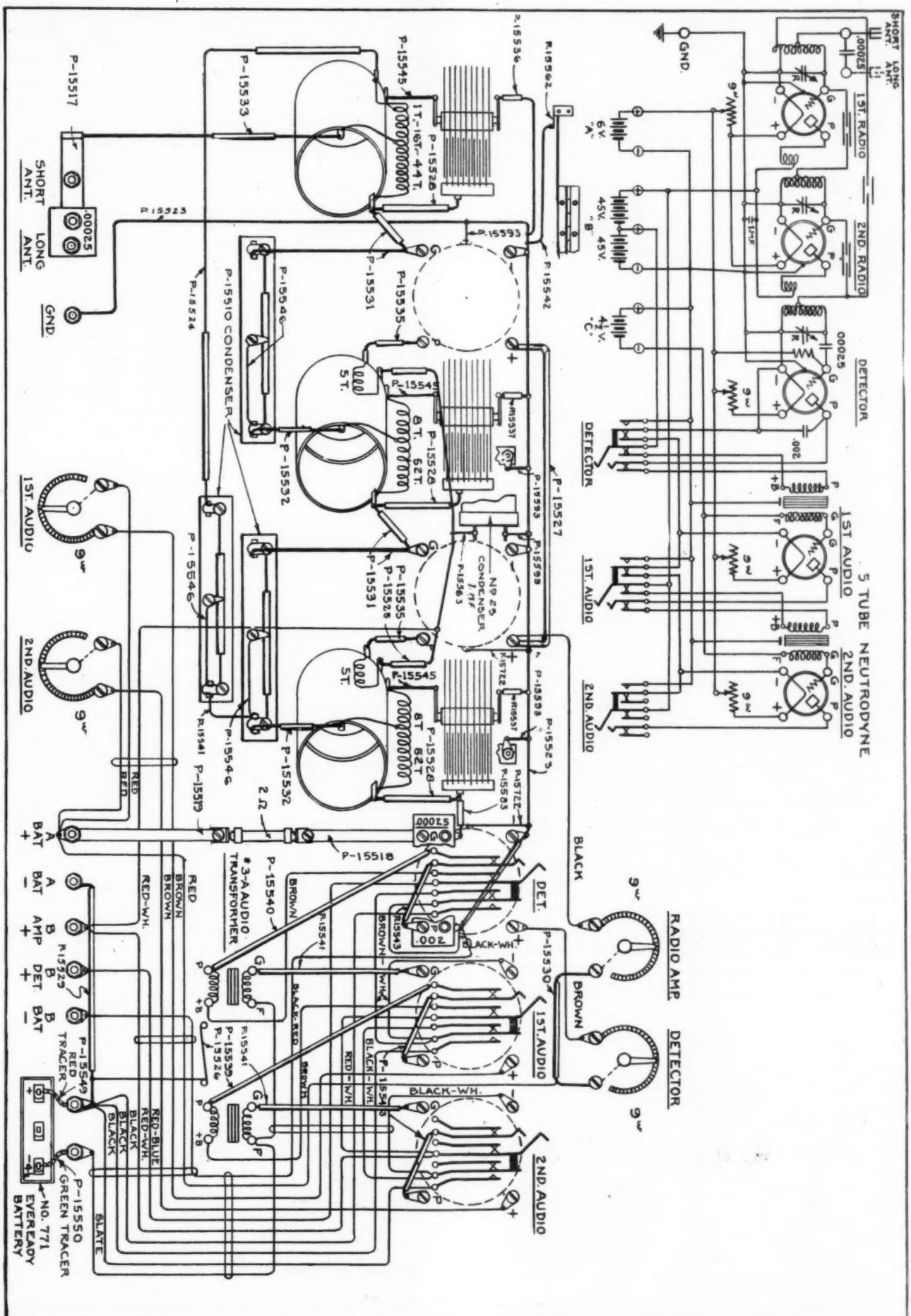


Fig. 19. Circuit and Wiring Diagram of a Well Known Factory Made Five-Tube Neutrodyne Radio Receiving Set.

did not reach this antenna or other pick-up device.

In Fig. 12 is listed some of the important features that should be considered when selecting a radio receiving set.

Contrary to the common notion, inventions of fundamental character in the radio

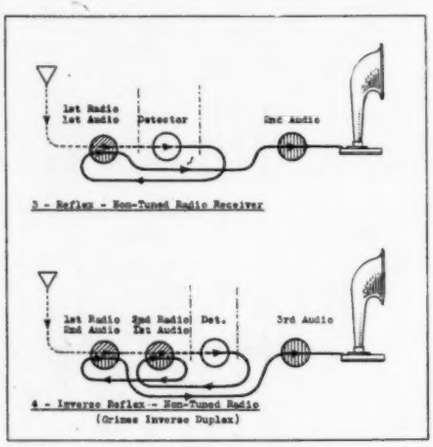


Fig. 15. Diagrams of Reflexed Non-Tuned Radio Receiving Sets.

art have been few and distributed over a period of a number of years. From the year 1911 (ten years before the successful introduction of broadcasting) until the end of 1922, there were developed only four fundamental systems of radio reception. These were:

1. The "Radio Frequency" amplification system. Developed in 1911 by German inventors and acquired by the United States government during the World War. Rights to manufacture under these patents are obtainable from our government.

2. The "Regenerative" system. Patented in 1913 by Major E. H. Armstrong, but shown to have been developed at an early date in the "feed-back" principle of Dr. Lee De Forest. The Armstrong patents are now controlled by the Radio Corp. of America and rights to manufacture are owned by 17 licensees.

3. The "Superheterodyne" system. Developed in 1918, during the World War, by Major E. H. Armstrong, three years before broadcasting began. It is now con-

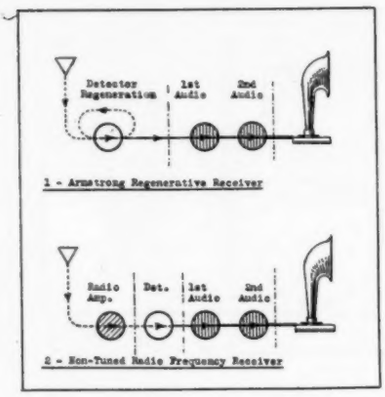


Fig. 14. Diagrams of Regenerative and Non-Tuned Radio Receiving Sets.

trolled by the Radio Corp. of America and a few licensees.

4. The "Neutrodyne" system, introduced by Professor Hazeltine in 1922, one year after broadcasting started. Rights to manufacture have been acquired by 14 licensees.

For a matter of discussion, the types of radio receiving sets are listed in Fig. 13 and are shown in simple diagrams in Figs. 14 to 18, inclusive. In these diagrams the various tubes are illustrated by circles, and lines are drawn through these circles to represent the path of the radio and audio currents from the antenna to the loudspeaker.

In the "straight-away" receivers, the circuit from the antenna to the detector tube handles only radio frequency currents, and the circuit from the detector tube to the loudspeaker handles only audio currents.

In the "reflex" receivers, some of the radio tubes also handle audio currents, serving the double purpose of radio and audio amplifiers and reducing the total tubes required for a given antenna pick-up and a given loudspeaker signal volume. This double amplifying service for some of the tubes, however, does not allow the same stability and quality of signal as is obtained from a "straight-away" receiver.

Fig. 14 illustrates a 3-tube Armstrong regenerative receiver and a 4-tube non-tuned radio-frequency receiver.

Fig. 15 shows a 3-tube reflex non-tuned radio receiver and a so-called inverse reflex non-tuned radio receiver.

Fig. 16 illustrates a 5-tube tuned radio-frequency receiver of the familiar neutrodyne type and a 4-tube reflexed neutrodyne type of receiver.

Fig. 17 illustrates a typical 8-tube super-

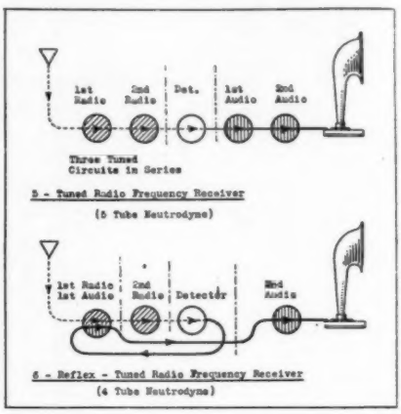


Fig. 16. Diagrams of Tuned Radio Receiving Sets, Including Reflex.

heterodyne receiver and shows how the intermediate frequencies are obtained.

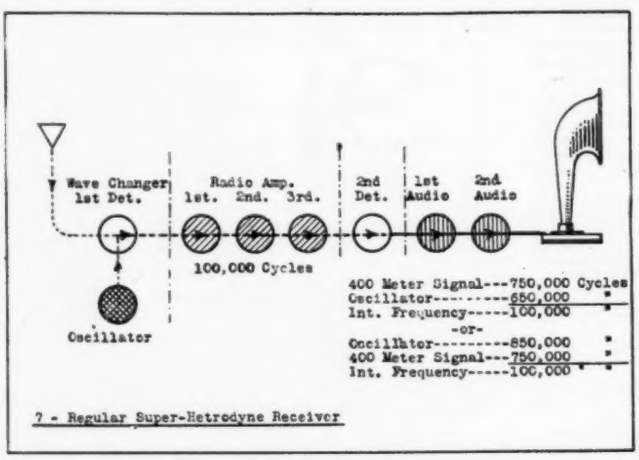
Fig. 18 illustrates a popular type of 6-tube superheterodyne receiver and the method of reflexing the first tube.

The actual wiring diagram of a 5-tube neutrodyne receiver as manufactured by a telephone factory is shown in Fig. 19. It will be noticed that this diagram follows the plan used in telephone switchboard circuit layouts.

Fig. 20 illustrates in diagram the wiring of a popular 6-tube superheterodyne receiver. Attention is called to the fact that a neutralizing condenser is employed between the plate and grid of the first tube to obtain the same effect as in the neutrodyne receiver; that is, to prevent feed back from plate to grid of the first tube and radiation from the loop or antenna.

Services and Charges of the Brussels Telephone System.

The telephone organization in Belgium is entirely in the hands of the national



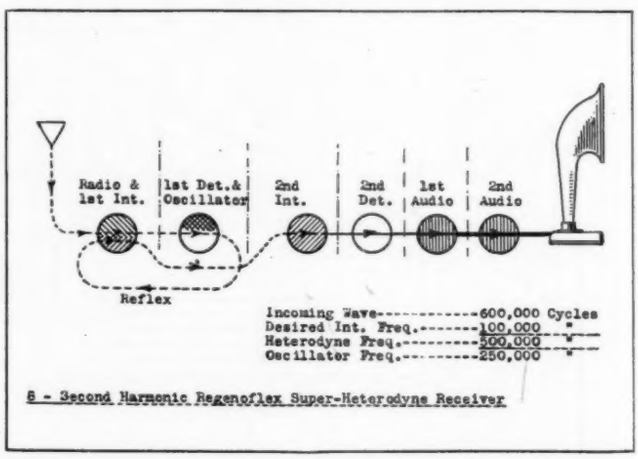


Fig. 17. Diagram of Eight-Tube Super-Heterodyne.—Fig. 18. Diagram of Six-Tube Super-Heterodyne.

government at present, though it is rumored that certain private interests are attempting to have the government release this control, according to a recent report from Herbert O. Williams, American consul in Brussels.

While the service is not perfect, it can be called very good, and the cost is much less to the subscriber than in the United States. The following is the tariff of charges paid in Brussels:

Basic charge .....$16.00 giving right to 600 city calls per annum

Extra calls ..... .0075
Regional calls ... .015

Interurban Calls.

For every 3 minutes—	8 a. m. to 6 p. m.	6 p. m. to 8 a. m.
Up to 75 Km.....	$0.05	$0.03
From 75 to 125 Km..	.075	.05
From 125 to 175 Km.	.1125	.075
Above 175 Km.....	.15	.10

Brussels is a city of almost one million inhabitants. The percentage of inhabitants who subscribe to the telephone system is much smaller than in an American city of this size. There were, February 28, 1925, only 31,656 subscribers; that is, one telephone to every 30 inhabitants. Brussels, however, has almost one-third of all the telephones in Belgium (105,036).

For comparison it may be noted that the number of telephones in Antwerp is 14,462; in Liege, 7,879; in Ghent, 4,622; in Charleroi, 3,458.

There are six "centrals" in Brussels, three of which are equipped with automatic telephones. It is the intention of the administration to extend this automatic system rapidly. When it is considered that two languages are commonly spoken, Flemish and French, and that there are several hundred English speaking persons (English and Americans) who are in business, it can be seen that the automatic telephone is of the greatest value, obviating, as it does, the necessity of calling the number.

The most important centers use the subterranean cable with large steel distributing towers to serve the different quarters of the city. In the busy central part of Brussels, however, it is aimed to make the entire distribution subterranean and thus avoid the necessity of the towers and overhead wires.

Interurban service as a rule is also very good, and except during the rush hours, from 9 a. m. till noon, connections are made very promptly. This is a great convenience for the consular service. The consulate general at Antwerp and the consulates at Ghent and Brussels are thus able to communicate one with another in a minimum of time. Information can thus be promptly obtained and much time saved, while, as will be seen from the tariff, the cost is almost negligible:

Between Antwerp and Brussels, $.05 for 3 minutes.

Between Antwerp and Ghent, $.05 for 3 minutes.

Between Brussels and Ghent, $.05 for 3 minutes.

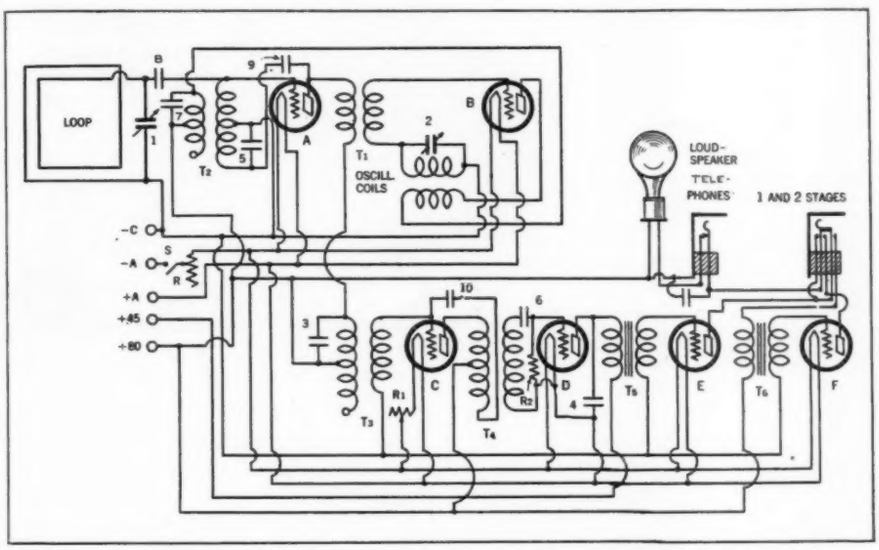


Fig. 20. Wiring Diagram of Factory Made Six-Tube Super-Heterodyne Receiver.

Dakota Central Acquires Wessington Springs (N. D.) Company.

The Wessington Springs Telephone Co., of Wessington Springs, S. D., operating some 300 telephones, has been sold to the Dakota Central Telephone Co., of Aberdeen, S. D. Some Minneapolis bankers were the late owners of the company. They acquired the Wessington Springs plant some two years ago and rebuilt the system last fall.

Progress Reported on Tecumseh's New Telephone Exchange.

Work is progressing rapidly on the new $25,000 home for the Tecumseh Telephone Co., of Tecumseh, Okla., of which Wilson Kirkpatrick is president and manager. The new building is to be of concrete blocks. New telephone equipment is to be installed in the building.

Sundry Snapshots Along the Trail

Observations and Comments, Pertinent and Otherwise, On the Sunshine and Shadows of Telephone Work

By Well Clay

Babbling brooks and shady nooks
With weather 'long in June
Make a strong appeal for us to steal
From work each afternoon.

Each summer's day we'd hie away
From our multitude of cares.
And travel far in our good old car,
Just to get away somewheres.

We'd lie and dream by limpid stream
Upon the soft green grass,
And while away the summer day
Watching the waters pass.

Though sad to state we have to wait
'Til duty is not so pressing,
Our work each day bids us stay
No matter how depressing.

Then let's have cheer if we must adhere
To a program thus exacting,
And gain some bliss for the things we miss
Which at times are quite distracting.

The small wood-tick, the nettle's prick
Or the sharp-tailed angry hornet,
Sore skins at night where insect bites
And red sunburn adorn it.

The mosquito sings as it plys its stings,
And the wild bees are not so funny.
We may long for bliss but these we miss
And then—we need the money.

Some of us are prone to make a virtue from the fact that we stay on the job a good deal of the time—at least, we wish our superiors to think well of us for so doing—thus claiming a negative virtue, when we think we had so much rather beat it and play truant for a few golden hours. But as often as not, we had just as soon stay on the job when we come to think of some of the drawbacks with which the wise dame Nature surrounds her treasured spots for protection.

We are, therefore, compensated to a reasonable extent for our fancied sacrifices and thus the work of the world is kept on the move. Nature is not taking

chances by making her sylvan retreats as enjoyable as the eye would have us believe, and her choicest spots are hardest to reach as well as her choicest moods the most difficult of attainment.

We never attain the ultimate. The empty mill reaps no profit, and the full hopper requires constant attention; so there you are. There are enough variations in the daily experiences of the average telephone manager to keep him interested, if he does have to stay on the job and, therefore, his lot is not so hard.

At this season of the year numerous storms provide entertainment, and constant moving of poles for highway workers is to be depended upon when all other sources fail.

It is a good thing, in a way, for while we are forced to repair we can take the opportunity of doing a thorough job of it and thus reinforce that particular part of the line a good deal; perhaps, making it unnecessary to be touched again for several years.

Many telephone companies have been very hard hit up in this part of the country by wind storms and tornadoes. These cyclonic disturbances have been frequent and damaging in the extreme for some companies. The Northwestern Bell Telephone Co. this week is employing men from five states to repair damage done by a twister down the Minnesota and Mississippi valleys the other evening. Over 8,000 telephones were out of commission in Minneapolis at one time.

Electric light companies too have been having a tough time of it with storms, and many communities have sat in darkness for varying periods of time nearly every night for a week. With many companies this damage will necessitate the calling out of financial reserves to put the lines back to normal again.

With all this extra unforeseen drain on the current resources on the telephone companies, what will the result show in their annual earnings if it is all taken out of current repairs?

"Telephone Companies Should Take Time by the Forelock and Lead That Old Gentleman Into the Bookkeeper's Office."

It seems that an extraordinary expense, like moving many miles of rural lines and putting them in shape again, should be spread over a period of years the same as a sleet loss and then the net earnings would not fluctuate in such an alarming manner from a comfortable dividend to less than nothing at all from one year to another.

The reason why it is better to keep the returns on a fairly even basis from year to year is that the public may continue to believe that the telephone stocks, while not paying excessively high returns, are reliable, continuous earners of a reasonable amount year after year and are, therefore, safe investments for non-speculative investors of funds where safety can be combined with reasonable earnings.

With the big companies, of course, that have their plant spread over several states, this may not be necessary as they can depend on the earnings from undamaged sections to repair the breaks in the storm areas; but with the smaller companies, when they are hit it will always be a different problem. When a man has but one shirt, it takes more or less figuring to arrange for laundering, and the small telephone companies are the ones who have to figure the closest and do not always wake up to the fact until necessity compels.

Telephone companies are not the only ones to be hit by storms and shifting of lines for road crews. The light and power companies are likewise subject to these extraordinary hazards and, like telephone companies, should take time by the forelock and lead that old gentleman into the bookkeeper's office and arrange for a few instructions as to how to avoid disastrous results.

Old Mother Hubbard has not only furnished amusement and instruction to countless children but could provide the average telephone company with a good lesson to think about. Cupboards are generally bare when reserves are not stored therein, and old Mother Hubbard probably knew, when she went to her famous but unsatisfying cupboard, that she would not be apt to find anything to satisfy her "poor dog" but went and inspected the cupboard, from force of habit.

Maybe she could not have helped herself in any event, even if she had taken thought previously, but the average telephone company can provide for tomorrow; and who doubts that there will be a tomorrow coming? A drifting boat is liable to get into trouble, and a drifting telephone company may look into the future with equal confidence.

We cannot, of course, foretell the date of storms, nor read the exact requirements of the future as to public highways and other programs, but we do know that there will be storms and different programs and that they will make dents in our finances. A hunter may not know what game he will meet while out hunting, but most wise sportsmen follow game trails with their guns loaded.

"Many Telephone Companies Have Been Hard Hit By Wind Storms and Tornadoes."

Not only should we be prepared to restore our lines after storms but we should be as well prepared as possible to restore them in the shortest possible time, remembering that the public will not only be as anxious for service then as they are today, but probably will need it much worse.

If a man's house burns, he can usually get shelter elsewhere at once, at least temporarily. But if a telephone or light system gets put out of commission, there is no place for the public to turn, for there is seldom a duplicate; and they would be in the same fix probably if there were. With the electric lights out of commission, we can makeshift with a candle or kerosene lamp, but with the telephone gone, distance once more becomes the same obstacle that it was to the former generations.

APHORISM: A good fisherman never forgets the bait.

Winter Park Company of Florida Triples Its Capacity.

The Winter Park Telephone Co., of Winter Park, Fla., is installing new equipment that will provide facilities for more than three times as many subscribers as it is now serving. At the present time the company is serving some 600 subscribers in a rapidly-growing community. Additional cables will be laid to Maitland, Altamonte Springs, Lake Howell, Forest City, Goldenrod, Gabriella, Eatonville and Fairview to take care of increased demand for service in those growing towns.

The new equipment is most modern and up to date and is provided with automatic labor saving features.

Northwestern Bell Decree Modified

Modification Secured by Northwestern Bell in Its Nebraska Rate Case Under Which It Is Permitted to Make Its Own Rates to Yield Return of 7½ Per Cent Until Such Time as Commission Acts—Company to Prepare Rates at Once

The Northwestern Bell Telephone Co. won a substantial victory in the federal court in Nebraska by securing the modification of a recent decree that will permit it to make its own exchange rates in the state, subject to the general requirements of law that they be just and reasonable and not in violation of any statute. These rates are to remain in effect until the commission shall have adopted its own rates and its members are restrained from interfering until those rates have been legally made effective.

The situation dealt with is one that often confronts public utilities which have successfully fought the putting into effect of rates made by some regulatory power. In this case the commission ordered the 10 per cent surcharge that had been allowed during the war period to be eliminated. The court held these rates to be confiscatory. Meanwhile the company had kept in effect the old rates. These, it also showed, were not sufficient to enable it to earn a reasonable return on its investment.

In order to get higher rates it would have had to go back to the commission that had decided the present ones were too great, and this, it contended, would be a futile thing. Meanwhile, for whatever period it would be necessary to thresh out the justice and adequacy of the new schedules, whatever they might be, and all the time, the confiscation would be going on. As the courts have steadfastly refused to act as rate-making bodies, the only alternative was to ask to be allowed to fix its own rates until such time as the commission acted. The commission opposed this as an invasion of ratemaking power.

Judge Munger, after a number of briefs had been filed with him, changed his decree to read as follows:

Modification of Decree Made by Judge Munger.

"The rates prescribed by the commission cause a rate of return much lower than the rate the master commends, a rate below that which the answer of the defendants admits is a fair rate, and one which, in the light of the decisions and of the testimony in this case, must be regarded as unreasonable and confiscatory.

It results, from what has been said, that a decree must be entered enjoining the enforcement of the order of the state railway commission. The plaintiff has asked that the decree also enjoin the defendants from interfering with the plaintiff's charging such rates for telephone service rendered by it in the state of Nebraska as will produce to plaintiff a return of approximately 8 per cent on the value of the property used in rendering such service. The master has made a recommendation of a decree allowing the plaintiff to charge rates free from molestation by the defendants which allow plaintiff a rate of return of 7½ per cent. The making of rates is a legislative, not a judicial act.

A decree, which should authorize the rates to be charged in the future, would be clearly the exercise of legislative power and not a decision upon the validity of a rate which has been prescribed or adopted. The rates which are now in force are in force by acts of the plaintiff or by order of the commission.

The court may not in the face of the statute grant the right to the plaintiff to change its rates generally, in order that it may earn a fixed per cent upon the investment. Rates that are in force may not be changed, unless application has been made to the commission for that purpose. Similar statutes have been held valid.

If the hearing of such an application causes delay, the plaintiff has a remedy against daily confiscation by seeking an injunction, pending final decision by the commission. But the effect of the injunction to be granted in this case is to set aside the exchange rates fixed in the commission's order of November 4, 1922; and thereafter there will be no legal rates prescribed by the commission in place of these exchange rates. Until the commission shall have adopted new rates, the plaintiff has the right to fix its own rates in place of the rates so enjoined, subject, of course, to the general requirements of law that they be just and reasonable and not in violation of any statute.

The decree will not attempt in advance to determine a percentage of return upon the investment which may be earned by the plaintiff, because such an order would fix the rates to be charged by the plaintiff. The question of a proper return can be presented, when an actual rate of return has been established. A decree will be entered accordingly."

The decree restrains the commission from enforcing or attempting to enforce in any way the order of November 4, 1922, insofar as that order purports to fix the rates to be charged for exchange service in the state. It is also enjoined from interfering by the imposition of penalties or otherwise with the charging by the Bell of exchange rates not approved or fixed by the commission, until such time as other or different rates are prescribed by the commission and become effective; and further that if the rates charged by the company by virtue of this decree are excessive, this decree may be modified or vacated as may seem just.

No Restraint on Future Exercise of Power by Commission.

As a further condition of the decree the company is required to file with the commission all rates for exchange service to be charged and collected by virtue of this decree prior to the time or times when they shall be placed in effect. Nothing herein shall be deemed to restrain the future exercise of the legislative power of the commission, and if circumstances so change as to make the rates of November 4, 1922, reasonably compensatory, the commission may apply to the court for such further order as may then be just, jurisdiction being retained for all proper purposes, as also for the purpose of awarding any further relief or to modify or vacate the injunction now awarded.

President Belt says that the company will, at once, prepare and file with the commission for immediate effectiveness, a new set of rates. These will run from 10 to 15 per cent more than those now in effect. This will give it the 7½ per cent return that the master said the company was entitled to earn.

"It is our policy," said Mr. Belt, "to refrain from increasing charges until every effort has been exhausted to operate satisfactorily on existing revenues. But when this cannot be done without impairing the quality of the service, we believe it to be our duty to seek an adjustment in rates.

"That we have been earning an inadequate return is shown by these figures of earnings: 1917, 5.15 per cent; 1918, 4.62 per cent; 1919, 3.09 per cent; 1921, 2.87; 1922, 3.05 per cent; 1923, 4.63 per cent and 1924, 4.55 per cent."

Sale of Tri-State Company of Uniontown, Pa., Announced.

The Bell Telephone Co. of Pennsylvania has closed a transaction for the purchase of the Tri-State Telegraph & Telephone Co., of Uniontown, Pa., subject to the approval of the state public service commission.

The Tri-State company went into the hands of receivers following severe damage to its outside by a storm about 18 months ago. It operates exchanges at Uniontown and 13 other points with a total of some 5,900 telephones.

Here and There in Telephone Work

Ohio Bell to Have Beautiful Business Building in Cleveland.

In order to provide space for telephone equipment necessary to care for the telephone service of the downtown section of Cleveland, Ohio, and to permit of the abandonment of the present Main exchange property at the corner of Champlain and Third streets, in connection with the construction of the new Union Depot in Cleveland, a new telephone building, which will be one of the most beautiful business structures in Ohio, is to be erected on Huron Road on the site of the old Empire Theatre and the Huron Road Hospital by The Ohio Bell Telephone Co. Work will be started at once and pushed to completion as rapidly as possible.

As soon as space in the new building is available, telephone equipment necessary to care for the service now handled from the present Main exchange building will be installed and made ready for the transfer of operations as rapidly as possible. The total cost of the new building alone will be upwards of $4,000,000.

The perpendicular Gothic style of architecture, which lends itself admirably to the modern multi-story office building will be employed. The plans follow the "set back" theory much used in New York and other large cities. This will produce an imposing mass effect and a delightful silhouette. The structure, which will have 20 stories, will be 324 feet high, and will be the tallest office building yet constructed in Cleveland, the height being greater than for an ordinary office building of the same number of stories because of nine floors with high ceilings to accommodate telephone equipment. It will occupy the full width of the lot, 154 feet, 6 inches, and will be 145 feet deep.

Because of the heavy construction required to carry the enormous weight of the telephone equipment, and to obtain the stability of structure necessary to the proper maintenance of it, excavation must be made 50 feet below the curb line so the foundation may rest on solid clay. Only a library or newspaper building, with its heavy presses, compares with the type of building construction required for a telephone building. This foundation depth will provide three basements, two of which give space for heating and power plants, machinery, shops and storage, while a third will provide space for a general restaurant, other purposes, and contain the cable vault.

The first floor will be used for the business offices of the company for Cleveland with space for several storerooms. The next six floors will house telephone equipment, which the company plans to install immediately upon completion of the building in order to vacate the present property which is to be sold to the Union Terminals Co. The eighth to the 13th floors will

Beautiful New Headquarters Building of Ohio Bell Company Now Being Erected in Cleveland.

take care of the long distance switchboards, information and special boards, terminal and telegraph equipment, together with operators' quarters, restrooms, kitchens and lunchrooms. The 14th to 19th floors will be used for general offices, while the executive offices will occupy the twentieth floor.

As the picture of the building shows, the first set-back will be at the eighth floor and for a distance of approximately 20 feet on each side of the building. The second set-back will be at the 16th floor and of approximately the same amount on all four sides of the structure. This set-back arrangement will provide the best possible lighting and ventilating conditions in the building, as well as improving the lighting conditions in the street below as compared with those surrounding a building of the usual type.

The building will have a floor space of 308,000 square feet exclusive of the basements. It will house the central office equipment required to replace the long distance board and the Main and Cherry central offices now located at West Third and Champlain streets, the Superior central office now in the Electric building on Prospect Avenue.

It will also house the general offices of The Ohio Bell Telephone Co. and the American Telephone & Telegraph Co. now at 4300 Euclid Avenue, the general commercial offices now in the Anisfield building at East Ninth and Prospect Avenue, the plant division offices at 6205 Carnegie Avenue and the traffic division and district offices now in the 4300 Euclid Avenue building, the directory, operators' training school, commercial training school and the northern division commercial engineer's office now in the Electric building on Prospect Avenue. This will give the building a population of more than 2,000 people.

The new building will, of course, be of fireproof construction throughout. The frame work will be of structural steel, thoroughly fireproofed, floors will be of reinforced concrete, windows will be of heavy gauge metal, sash will be glazed with wire glass, and wherever fire hazards warrant, full automatic rolling steel shutters will be provided for window openings. The doors will be of approved metal construction while the stairs will be of metal with non-slip treads.

Elevators of the latest and approved design are provided and will be equipped with the most modern safety devices. They will have a speed of 600 feet a minute.

President C. P. Cooper, in discussing the plans, called attention to the fact that many problems are involved in the construction of telephone buildings which are not met in a usual office structure. That they may stand up under the enormous amount of iron, steel, copper and lead which is used in telephone switching apparatus and other central office equipment, they must be more solidly built to stand the greater floor loads. In an ordinary building the floor load is 70 pounds to the square foot, while in telephone buildings provision must be made for a floor load of 150 to 200 pounds per square foot.

Another point stressed by Mr. Cooper was that the height of the building is made necessary because many of the stories used in housing the equipment must be higher than in an ordinary building. For example, in the average office building the distance from floor to ceiling is 9½ to 10 feet, while on some of the floors in the new Bell building the dis-

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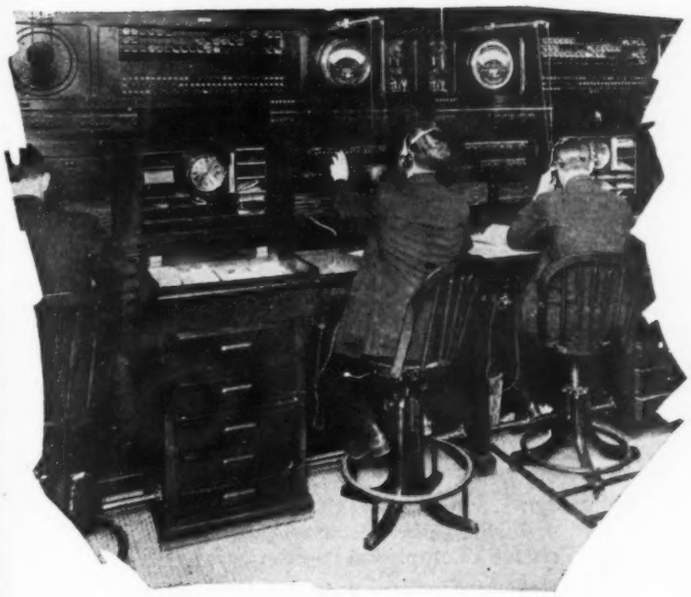

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tance will be 19 feet. He pointed out that many of the column sections to be used will weigh more than 20 tons—the heaviest columns of any building in Cleveland.

"In planning the building," Mr. Cooper said, "The Ohio Bell Telephone Co. considered the growth of Cleveland far in the future as based on survey made by its engineers, and decided on a structure which would be adequate to speedily and economically meet the demands for additional telephone service. As the building will house the general offices, provision must be made for the growth of the system throughout the state so as to accommodate the increasing forces expansion will require. The equipment throughout the building will be installed with a view to its future as well as present use. The quality of service and its protection 24 hours of every day has been given every consideration."

Large Private Telephone System of New Jersey Power Company.

Public Service Corp. of New Jersey is said to enjoy the distinction of having the largest private telephone system in the United States, in point of wire mileage and area covered. There are approximately 1,500 extension stations in the system and about 200 central office trunk lines with 80 tie lines—a total of nearly 1,200 miles.

Extensive additions are now being made which when completed will make the system the largest in point of equipment as well as in point of wire mileage and area covered.

This vast network of telephones spreading over the entire state is the means employed by operating subsidiaries of the Public Service Corp. to keep unified its many activities. The system consists of 35 exchanges tapping all the principal operating and commercial centers throughout the state, from Ridgewood on the north to National Park on the south. They are connected by tie lines used exclusively for the transaction of company and inter-company business.

The system is so arranged that rapid communication is assured in almost any emergency. For instance, Camden or Philadelphia can be reached from any part of the system in a few seconds, in a fraction of the time that would be taken by using an outside line. There are two direct company lines to Camden and three to New York, and others are being planned.

To relieve the present congestion and to provide capacity for future business growth, the main telephone exchange in the Newark Terminal building is being enlarged from 13 to 21 positions. This work will be completed, it is expected, about August 15.

The main exchange is in the Newark Terminal building, Newark, from which radiate all connecting lines to various outlying exchanges. There are 740 extensions in the main office, including the building and nearby operating offices. The four exchanges in Jersey City have a total of 147 extensions. Camden has 108 such extensions, Paterson 75, Elizabeth 60, Hackensack 55, Trenton 45, Passaic 40, Plainfield 35, New Brunswick 20, Montclair and Perth Amboy 25 each.

More than 100 operators are employed who handle an average of 75,000 calls daily, and as many as 100,000 calls on days when business is exceptionally heavy, or when there are abnormal emergency calls.

Rapidly increasing gas and electric business has necessitated the installation of a separate board in the home office, with operators versed in details of the commercial business of those departments. A large part of the negotiations relating to new service to customers is transacted by telephone.

At Irvington an 80-line switchboard has been placed, equipped with 60 working stations, seven trunks to the Bigelow exchange and seven tie lines to the main exchange at Newark terminal.

An elaborate telephone equipment at the new Kearny power station will be ready when the station is completed. An 80-line switchboard will be installed at Marion power station and will take in all operating stations in the Marion zone including the West End Gas Works and adjacent territory.

In Englewood, the exchange will be transferred from the electric substation to the new commercial office about to be erected. At Perth Amboy, the exchange is being enlarged to an 80-line switchboard. A second position is being installed at Passaic and one also at Trenton.

HAPPY CONTACTS

By Miss Anne Barnes,

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa.

This morning a man down in the alley woke me early by his cussing a horse. He promised the horse the breaking of every bone in his body if he did not stand still.

What a terrible way to start a day for the man, his horse, and for me, but I surely felt most sorry for the horse, because he had to spend his whole day with that man—harnessed, driven hard, and cussed at.

When I got to thinking of that man, I realized that he was much worse off than the horse. There he was harnessed to a bad disposition from which he was never free. That disposition drove him; controlled his tongue, forcing it to say unkind things to both men and beasts.

At our tributary conference today, I was told of an operator who was harnessed to the same sort of a bad disposition. It drove her out on circuits and forced her to say ugly things to neighbor operators. Because her manager was sort of easy, she got by—I said her manager, but I made a mistake. She had only one manager and that was her bad disposition, and that manager was a hard task-master.

It forced her to make enemies by saying harsh, ugly things. It would not let her be happy. It put a sign out on her countenance: "This person is my exclusive property. (Signed) Bad Disposition."

Of course, we all reach the end of the Road of Life some day. We expect that. I was thinking of that poor shackled man in the alley and that poor shackled operator. Some day they will be freed at last from the control of Bad Disposition. A neat little headstone may tell a little white lie, but the world will pass by thinking its own thoughts.

I read this beautiful tribute to one of our Iowa authors who recently reached the end of the Road of Life. It said, among other fine things: "He gave much to life, and in return he received much from life. He had expressed himself as having enjoyed life immensely, that he had had loads of fun."

What meant most in life to him? Was it not happy contacts?

MORAL: No little white headstone needs to stand up for him and tell a little white lie until Eternity. He has left his message in the heart of humanity—and it's a person-to-person message.

Earnings of A. T. & T. Co. for Four Months of 1925.

The American Telephone & Telegraph Co. has reported to the Interstate Commerce Commission gross earnings of $6,972,742 in April, compared with $6,142,250 in April, 1924. The month's gross in 1923 was $5,937,193. Net operating income was $3,184,275 this April, against $2,615,226, last year.

Four months' gross was $27,585,120, against $24,685,541 in 1924, and net operating income $12,537,472, against $10,503,550 last year.

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Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision Over Telephone Companies—Decisions of Courts in Matters of Interest to Public Utilities and Actions of City Councils Relative to Franchise, Rates and Service

No Undue Discriminations Found in South Jersey Rates.

Finding no evidence of undue discriminations against towns and individuals in the increased rates now being charged by the Delaware & Atlantic Telegraph & Telephone Co., the part of the Bell system which covers approximately the southern half of New Jersey, the state public utilities commission, on June 6, announced its refusal to order a readjustment of these rates.

Following the increases, which became effective January 1, there was general criticism of the new schedules as discriminating between various classes of subscribers and different communities. Among the latter, Trenton and Atlantic City were the most active, contending that those municipalities were compelled to pay more than a fair share of the increase. From individual subscribers, the principal complaints came from patrons operating private branch exchanges.

Five more or less specific allegations were relied upon in the arguments before the commission as a basis for a readjustment of the rate schedules. These included alleged false impressions conveyed by the publicity given to the increase in rates; various principles involved in developing telephone rate schedules; criticism of the large increases in particular rates, notably private branch exchanges; allegations as to discrimination against localities and suggestions as to decreases in certain rates and increases in others.

In determining that the telephone company had not created false impressions by the character of publicity given the proposed increase, the commission referred to newspaper articles published at the time the proposed increased schedules were announced, indicating that their practical effect had not been kept away from the public. On the contrary the board said customers sufficiently interested could readily have ascertained the amount of increases in rates affecting their own service had they desired to do so.

In its analysis of the various factors entering into the problem of allocating operating costs on an equitable basis the commission stressed the relative amount of the rate for a given class of service measured largely by the value of that service.

In fixing the present rates, the commission placed a value of $18,450,000 upon the property of the company for rate-making purposes and estimated that the present rates would yield $1,240,000 a year, this being $145,000 less than the fair return which the board indicated the company was reasonably entitled to receive. The estimated revenue approximates 6.72 per cent on the value as found.

Higher Business Rates Are Ordered for St. Louis, Mo.

An order granting the Southwestern Bell Telephone Co. authority to increase rates on business telephones in St. Louis, adding about $894,000 a year to the revenue of the company, was granted June 6 by the Missouri Public Service Commission, which set July 1 as the date on which the increased rates shall go into effect.

The new rates, according to a provision of the order, shall continue for 13 months, after which the present schedule shall go back into effect, unless the commission makes another order for a continuance of the increase.

The commission, in its order, fixed the tentative valuation of the St. Louis property of the telephone company at $24,700,000, on which 5 per cent for depreciation and a 7 per cent earning return are allowed. This valuation is $4,700,000 higher than that contended for by the city of St. Louis, through C. E. Smith, consulting engineer for the city, who, at public hearings on the rate case, declared that $20,000,000 would be a fair valuation on which to base earnings for the St. Louis properties.

The company wanted a valuation of $30,000,000 on the St. Louis properties, and in this connection the commission states in the order that the valuation proposed by the city and that by the company were given serious consideration in arriving at the figure of $24,700,000.

The commission pointed out that, in arriving at a valuation figure, it had followed the ruling of the court on reproduction cost, depreciation, allowances for working capital and going value.

The increased rates will affect 23 per cent of the subscribers in the city of St. Louis. Under the order one-party measured service, which now costs the subscriber $4 for a limit of 67 messages a month, will cost $6 for a limit of 100 messages. The unlimited maximum business service telephones, which now cost $13 a month, will cost $14 a month under the new order. The cost of private branch exchange service also is increased under the order.

Commenting on the accumulated increase in revenue to the telephone company, the commission says the total will be reduced to $735,000 a year by deduction of taxes.

The company is directed in the order to file a detailed report with the commission at the end of a year after the new rates go into effect, showing the results of the increase, both as to revenue and service.

Why Company Has No Difficulty in Selling Stock Locally.

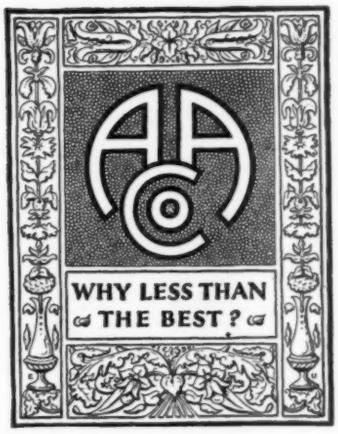
C. L. Kelly, president of the Farmers Telephone Co. of Dodge County, North Bend, Neb., has made application to the state railway commission, for authority to issue $5,000 worth of stock to finance additions and betterments. The company now has an investment of $140,000 in property, over 1,600 subscribers and operates five town exchanges.

"We find no difficulty in selling any stock that we issue in our neighborhood," says Mr. Kelly. "The reason is that we pay 8 per cent dividends regularly, and people are looking for an investment in it. Often we have men tell or write us that they will have $500 to invest on a certain date, and that they would like to take some of our stock. This makes financing easy for the company, and the same policy will produce the same results wherever it is tried.

"From the beginning in 1901 our company, either through stock dividends or cash payments, has averaged an 8 per cent return. For the present situation we have the railway commission largely to commend. Ever since Commissioner Wilson, some eight or ten years ago, insisted on our putting in the proper accounting system and paying dividends regularly when earned, instead of using the money for extensions and betterments, we have found it easy to sell stock in our own towns and to our own patrons. It has given our stock a standing and a value, and added to the prestige of the company.

The company is steadily growing, and we are able to extend service wherever it is wanted because the money to do it is easy to get. If a man wants service that will cost us $150 to reach, he will readily buy stock for that amount if he has the money and if he does not have it, we can go into town and place it without trouble. This is also of value in maintaining and improving the service.

Now and then we must needs put in a new switchboard or some other form of expensive construction. Where this cost exceeds the original replacement value, it



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A few of the telephone properties that have been appraised by The American Appraisal Company for financing operations, rate cases, or other requirements are:

Jamestown Telephone Corp., Jamestown, N. Y.; Rochester Telephone Corp., Rochester, N.Y.; Northern New York Telephone Corp., Plattsburg, N.Y.; Ohio Bell Telephone Co., Cleveland, Ohio (Canton Area); Tri-State Tele. & Tele. Co., St. Paul, Minn.

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means new capital, of course, and with our record of paying dividends, we can get the money by selling stock and without any trouble whatever."

Rhode Island Bell Property Valued at 22 Millions.

At the hearings conducted by the Rhode Island Public Utilities Commission during the week of June 2, on the application of the New England Telephone & Telegraph Co. for permission to increase its rates in Rhode Island, Chief Engineer George K. Manson spent considerable time explaining the company's $22,000,000 appraisal and inventory of its property in that state.

Central office equipment was appraised at $3,000,000, this being the largest single item in the inventory. Among Mr. Manson's exhibits were a series of photographs showing the equipment in the various exchanges throughout the state.

In the past four years the valuation of the Rhode Island properties of the Bell company has increased from $7,000,000 to more than $22,000,000 according to the inventory and appraisal.

Connection Charge Upheld by South Carolina Commission.

The charge of $1.50 made by telephone companies of South Carolina to cover "in part directory, accounting, circuit and switchboard expenses where service is established by the use of instrumentalities already in place in the subscriber's premises" was held to be "just and reasonable" by the state railroad commission following a hearing in Columbia on May 28.

On complaint of several subscribers the telephone companies of the state had been cited to appear before the commission and show cause why the charge should not be amended or repealed. Representatives of various telephone companies of the state attended the hearing and submitted financial exhibits and satistics to show that the charge imposed was necessary to meet the costs involved in the service rendered.

Seattle and Spokane Rate Cases Opened in Federal Court.

Hearing was begun at Seattle, on June 2, before Dean John T. Condon, sitting as master in chancery for the United States district court, in the matter of the 25 per cent increase in rates sought by the Pacific Telephone & Telegraph Co., for Seattle and by the Home Telephone & Telegraph Co., of Spokane. The increased rates have been charged by the companies since August 1 under a temporary court order restraining the Washington Department of Public Works from interference.

Upon the opening of the hearing the court modified the ruling by which testimony was barred relating to the 4½ per cent contracts with the American Telephone & Telegraph Co. Judge Condon ruled that the state may inquire into the contract.

Alex. M. Winston, city attorney for Spokane, was forbidden to go into the Western Electric Co.'s affairs. Attorney Winston told the master he wished to develop whether the Western Electric has a monopoly on telephone supplies and whether the American and Pacific companies could not do better if able to buy in the open market.

F. L. Rhodes, New York City expert, testified that the American company's revenues came entirely from stocks and bonds, from long distance service and from the 4½ per cent on revenues of associated concerns.

The state and cities disagreed with the companies on three issues. The first was in the valuation of the companies' properties.

The second was on the 4½ per cent contract.

The third point was in regard to a fixed sum set aside for depreciation and reserve. The company had fixed this at 5¾ per cent and the state ordered it down to 3½ per cent for two years.

Rural Rates in Vicinity of Superior, Wis., Increased.

The Superior Rural Telephone Co., a small mutual telephone company serving a total of 27 subscribers in the rural district adjacent to the city of Superior, was recently authorized by the Wisconsin Railroad Commission to increase its rates from $1.60 to $2 per month, with an extra charge of 25 cents for desk sets. The increase will net the company about $130 additional in revenue per year.

The company serves its subscribers over two full metallic lines aggregating 21 miles of poles and 63 miles of wire. No exchange is maintained, switching service being received from the Superior exchange of the Wisconsin Telephone Co. at the rate of $9 per year per subscriber.

Summary of Commission Rulings and Schedule of Hearings.

CALIFORNIA.

June 8: Roseville Telephone Co. applied for permission to issue and sell 785 shares, at $10 per share, of its common stock for the purpose of reimbursing its treasury for money expended for additions to plant.

ILLINOIS.

June 2: Order approving lease by the Chicago & Eastern Illinois Railway Co. to Albert Smith and Earl Smith, doing business under the firm name of Milford Telephone Co., of certain premises in Milford, Iroquois county, for five years from May 15, 1925 at $10 per year. L-8953.

June 3: Petition of the DeKalb County Telephone Co. for a rehearing on proposed advance rates for telephone service in the cities and villages of DeKalb, Sycamore, Hamond, Fairdale, Genoa, Hinckley, Malta, Kingston, Lee, Kirkland, Maple Park, Shabbona and Waterman and vicinities, county of DeKalb, stated in rate schedule IPUC 4 and toll rate Schedule Ill. C. C. 1 of DeKalb County Telephone Co., denied. No. 9322.

June 3: Order permitting the Illinois Bell Telephone Co. to file schedules of rates designated as Ill. C. C. 2 for telephone service in Rochester, Mechanicsburg, Buffalo and Riverton, Sangamon county, effective June 1, 1925; also, directing the Illinois Bell Telephone Co. to provide all necessary facilities for the establishment of express toll service between Springfield and the towns named in the stipulation referred to in order, and for the restoration of free service between its Rochester and Mechanicsburg exchange not later than September 1, 1925; also, annulling and cancelling rate schedules Ill. C. C. 2 for Rochester, Mechanicsburg, Buffalo and Riverton filed February 27, 1925, for the Illinois Bell Telephone Co. Nos. 14756 and 14770.

June 3: Order authorizing the Bushnell nell Telephone & Telegraph Co. to purchase, and the Mann Telephone Co. to sell, the entire telephone property and assets of the Mann Telephone Co. in the city of Bushnell, McDonough county, Ill. and vicinity, for $60,000 under conditions set forth in order; also, granting to the Bushnell Telephone & Telegraph Co. authority to construct and operate a telephone exchange and to render service in the territory now served by the existing telephone property in Bushnell, McDonough county, Ill. and vicinity; also, authorizing the Bushnell Telephone & Telegraph Co. to issue and sell $23,200 aggregate par amount of its common capital stock, 464 shares at par value of $50 per share; $15,000 aggregate par amount of its 7 per cent preferred capital stock, 150 shares of par value of $100 per share; and $25,000 aggregate principal amount of its first mortgage, gold bonds, dated June 15, 1925, maturing June 15, 1945, bearing interest at rate of 6½ per cent per annum, payable semi-annually, stock to be issued so as to net company not less than par value; also, authorizing the Bushnell Telephone & Telegraph Co. to execute and deliver its first mortgage or deed of trust, dated June 15, 1925, to Albert C. Roach, of Bushnell, Ill., as trustee. Nos. 15120 and 15121.

June 3: Order authorizing the proposed sale of the telephone property of the Citizens Telephone Co. between Springfield and Pekin, Ill., as described in bill of sale between joint petitioners on March 11, 1925, to the Illinois Bell Telephone Co., for the consideration agreed upon between the parties. No. 15026.

June 3: Order suspending until October 10, 1925, proposed rates for rural telephone service in Hamel stated in rate schedule Ill. C. C. 2 of the Hamel Mutual Telephone Co. No. 15220.

June 3: Order authorizing the State Center Telephone Co. to purchase and the Maroa Telephone Co. to sell, as of April 1, 1925, the entire telephone property of the Maroa Telephone Co. in the city of Maroa, Macon county, and vicinity, with exceptions as noted in order, for $18,550; also, granting to the State Center Telephone Co. a certificate of convenience and necessity to construct and operate a telephone system and to render service in territory now served by the existing telephone property in Maroa, Macon county, and vicinity; also, authorizing the State Center Telephone Co. to issue $5,000 aggregate par amount of its common capital stock, of 500 shares at par value of $10 per share, $10,000 aggregate par amount of its 7 per cent cumulative preferred capital stock, of 100 shares at par value of $100 per share, and $15,000 aggregate principal amount of its first mortgage bonds, dated May 1, 1925, maturing May

1, 1930, bearing 6 per cent interest per annum. No. 15107.

June 3: Order vacating and setting aside suspension order entered on April 29, 1925, suspending rates schedule Ill. C. C. 2 of the Boynton Telephone Co. applying to Pleasant Plains and New Berlin; also, permitting and authorizing the Boynton Telephone Co. to place in effect Ill. C. C. 2, schedule of rates on file with the commission for service in Pleasant Plains and New Berlin, Sangamon county, and vicinities, effective June 1, 1925, on conditions set forth in order. No. 15029.

June 16: Hearing at Springfield in the matter of complaint of refusal of Van Curen Telephone Co. and Illinois Bell Telephone Co., defendant company to reconnect toll line of Farmers & Merchants Telephone Co. of Moultrie County between Lovington and Hammond. No. 13877.

June 17: Hearing at Springfield in the matter of proposed advance in rates for telephone service in Rushville and Camden, Schuyler county, stated in rate schedule Ill. C. C. 4 of Schuyler Telephone Co.

June 17: Hearing at Springfield in the matter of proposed advance in rates for telephone service in Georgetown, Westville, Catlin, Fairmont, Fithian, Indianola, Oakwood and Ridge Farm, in Vermilion county, stated in rate schedules Ill. C. C. No. 1 and Ill. C. C. No. 3 of Vermilion County Telephone Co. Petition filed by residents of village of Ridge Farm protesting against increased rates by Vermilion County Telephone Co. No. 14757.

June 17: Hearing at Springfield in the matter of proposed advance in rates for telephone service in Cropsey, McLean county, stated in rate schedule Ill. C. C. 1 of Cropsey Telephone Co. No. 14760.

June 17: Hearing at Springfield in the matter of proposed advance in rates for telephone service in Hudson, county of McLean, stated in rate schedule of Ill. C. C. 2 of Hudson Telephone Co.

June 18: Hearing at Springfield in the matter of proposed advance in rates for service in Chatham, stated in rate schedule Ill. C. C. 1 of Union Telephone Co.

INDIANA.

May 2: The commission authorized the Rossville Home Telephone Co. to issue additional capital in the amount of $14,000, the stock to be sold at not less than par and the proceeds derived therefrom to be used for the reconstruction of the property. No. 8002.

May 2: The commission authorized the Merchants Mutual Telephone Co., to file an amendment to its schedule of rates providing for 50 cents per month for additional stations in hotels in Michigan City. No. 7986.

The Policy

of Lynton T. Block & Co. is to issue the most satisfactory and comprehensive insurance to be had anywhere—

Furnishing absolute protection at cost.

Embodying all the standard features and more.

Covering special classes and selected risks.

Selling at established rates.

Returning savings at the end of the policy period, depending upon the individual experience of the risk.

Giving a claims service that is not equalled elsewhere.

It is an honest policy, carried out in an honest way and gives a square deal under all conditions.

This forms the creed of every member of the organization and has built up the reputation of Lynton T. Block & Co. until it is one of the best and most favorably known in the Mississippi Valley.

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Workmen's Compensation
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LYNTON T. BLOCK & CO.
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Federal Telephone Equipment

The illustration shows one of the many FEDERAL STANDARD TELEPHONES installed in the power houses of the U. S. Lighthouse Service.

FEDERAL TELEPHONES were chosen for these installations because they are built for a LONG LIFE of service, their LOW COST of maintenance, requiring MINIMUM ATTENTION and their ability to absorb abuse.

Use Federal Telephones when making new installations or replacing old equipment and enjoy this freedom from maintenance cost.

Federal Telephone Manufacturing Corporation
Buffalo, New York, U. S. A.

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

June 2: The commission authorized the Citizens Independent Telephone Co., of Brazil, to sell $104,000 in common and $25,000 in preferred capital stock. The money derived from the sale of the stock is to be used in the erection of a new building and purchase of new equipment.

June 2: The Orestes Telephone Co., serving some 100 patrons in the vicinity of Orestes, was given permission by the commission to reduce its rate for business service to $1.50 per month and its residence rate to $1. Some time ago the Orestes company increased its rates, with the approval of the commission, whereupon a number of its patrons discontinued their telephones. On April 15 of this year the company applied for permission to restore the old rates, which permission was recently granted.

June 5: Indiana Bell Telephone Co. authorized to sell its property at Rome City to W. C. Yergin and John E. Fox for $350.

June 5: The Paoli, Unionville and English Telephone Co. received authority to discontinue service beginning July 1, and to sell its property.

June 5: The Lafayette Telephone Co. authorized to increase its common capital from $600,000 to $750,000, the new issue to be in shares of $50 par value.

June 6: The Farmers Co-Operative Telephone Co. in Kosciusko county authorized to discontinue the practice of permitting service to be given by exchanges under its control for which no charge is made and for which no fee is charged.

MINNESOTA.

June 19: Hearing at Amboy in the matter of the application of the Willow Creek Telephone Co. for leave to operate the local telephone exchange in the village of Amboy. M-1490.

June 24: Hearing at St. Paul in the matter of the application of the Northwestern Bell Telephone Co. for authority to change its schedule of telephone rates at Cloquet. M-1345.

June 24: Hearing at St. Paul in the matter of the application of the Northwestern Bell Telephone Co. to change and increase its rates for telephone service in Detroit. M-1372.

MISSOURI.

June 6: The commission approved increases in the business rates of the Southwestern Bell Telephone Co. in St. Louis which, it is estimated, will increase the company's annual revenue by $894,000.

NEW HAMPSHIRE.

June 2: The commission suspended increased telephone rates sought by New England Telephone & Telegraph Co. until October 1 and ordered an investigation of proposed changes. The suspension was on motion of the commission and hearings were ordered to be begun July 14.

NEW JERSEY.

June 6: The commission refused to order a readjustment of the rates of the Delaware & Atlantic Telegraph & Telephone Co., placed in effect January 1 upon its approval, finding no evidence of undue discrimination against the complainant towns and individuals.

NEW YORK.

June 8: Application filed by the Black River Telephone Co., of Lowville, N. Y. for permission to increase its rates 75 cents a month for individual service and 50 cents a month for two-party and rural line, business and individual line residence service. The increase for other classes of residence service including rural would be but 25 cents a month.

The proposed monthly schedule follows:

	Business	Residence
Individual line	$3.50	$2.75
Two-party line	3.00	2.25
Four-party line		2.00
Rural line	2.50	2.00
Extension	1.00	.75

June 15: Hearing at New York in re complaint against maximum rates of New York Telephone Co. fixed by the commission January 25, 1923. No. 1789.

June 18: Hearing at Syracuse in re petition of New York Telephone Co. for permission to discontinue its Cayuga central office district, it being proposed that it shall be included in the Auburn district. No. 2587.

June 18: Hearing at Syracuse on complaint as to amount of charge for directory listings (if no answer call 2-1167) under telephone numbers of certain physicians and surgeons in the Syracuse telephone directory. No. 2598.

OHIO.

June 1: The commission authorized the Cincinnati & Suburban Bell Telephone Co. to issue $4,000,000 additional common stock. It is to be sold at par and the proceeds used (a) to reimburse the treasury for $3,065,110 uncapitalized capital expenditures to December 31, 1924, which includes a total of $1,826,007 work in progress and (b) to finance a $934,590 budget of additions and improvements.

June 10: Upon the protest of H. J. Miller, on behalf of the subscribers, the commission suspended the following increases in net annual rates which the Sycamore Telephone Co. had published to become effective July 1:

Business, individual	$27 to $33
Business, four-party (new)	$30
Residence, individual	$21 to $28
Residence, four-party	$19 to $26
Residence, rural	$18 to $24

June 10: Applications filed for the approval of the reorganization of the Shelby Telephone Co., with exchanges at Shelby and Tiro as follows:

Joint applications of the Shelby Telephone Co., (incorporated 1905, which with $400,000 stock outstanding, submits an appraisal of its property showing a present value of $218,538) for authority to sell all of its assets subject to an indebtedness of $14,100 to the Shelby Telephone Co., incorporated in 1925, for $200,000, payable in securities.

Application of the Shelby Telephone Co., incorporated in 1925, to issue in payment for this property $100,000 common stock and $100,000 7 per cent preferred stock, and, also, to issue and sell at par $14,100 7 per cent preferred stock to pay assumed obligations. Property values will be checked.

June 13: The commission, stating that it has jurisdiction of the premises and that relief can undoubtedly be found in a proper suit, declined to consider a plea of some 25 stockholders of the Newport Farmers Mutual Telephone Co. for an investigation of its affairs, it being alleged that the present board of directors were unlawfully elected and that they are mismanaging the property. There being included in the pleading an allegation that service cannot be secured, the commission has stated further that it will receive and consider the complaints of any unsuccessful applicants for the company's service.

OKLAHOMA.

June 16: Hearing on application of Southwestern Bell Telephone Co. for increase in rates at ElReno. No. 6626.

June 17: Hearing in the case of John A. Simpson vs. Southwestern Bell Telephone Co., alleging discrimination against patrons at Weatherford and asking for relief. No. 5568.

PENNSYLVANIA.

June 4: Considerable increases as well as a few decreases and changes in the Bethel Telephone Co. service are announced in a tariff filed with the public service commission to become effective July 1. The company furnishes service to Brightwood, Brookside Farms, Library, Bethel township, Snowden township, Jefferson township, Upper St. Clair township, Baldwin township, Alleghany county and Peters and Union townships, and Washington county.

With the Manufacturers and Jobbers

Monster Telephone Battery to be Used in Greater London.

In connection with the Strowger automatic telephoning of Greater London, now in progress, there are being supplied by the Chloride Electrical Storage Co., Ltd., of Clifton Junction, Nr. Manchester, four storage batteries of record size and capacity, so far as telephone service is concerned.

There are four batteries in all, two of which will supply the current for operating the Holborn mechanical tandem exchange, and the others that for working the Strowger automatic equipment in the Holborn exchange proper. Both installations are in progress, the responsible contractors and manufacturers of the Strowger equipment being the Automatic Telephone Mfg. Co., Liverpool.

In point of actual dimensions of individual cells, those constituting these batteries will be the largest yet installed in Great Britain for telephone service.

The overall dimensions of each cell are: Length, 5ft. 8 ins.; width, 1 ft. 8 ins.; overall height, 5 ft. There are 35 positive plates, and the total weight per cell, including electrolyte, is 4,600 pounds or over two tons. Overall plate dimensions are: Height, 29 ins.; width, 14 ins.

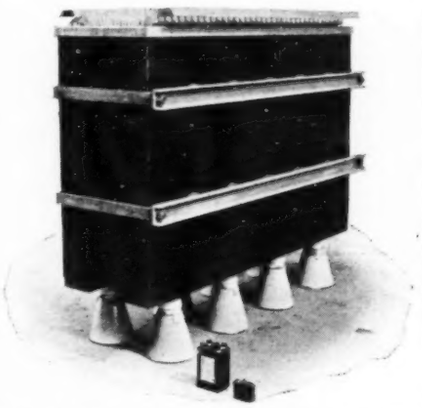
The containers are of wood, lined with lead, and the positive and negative plates are separated by glass tube separators. All plates of common sign are burned to heavy lead connecting bars, fitted with suitable terminal cups at the ends of each battery, to which the main copper bus bars will be attached.

The positive plates are of pure lead, "Plante" type, and the negatives of the box type.

The cell capacities are 8,400 ampere hours discharging in five hours to 1.85 volts per cell, and 9,870 ampere hours discharging in 9 hours to 1.83 volts per cell.

Taking into account the very small currents required to actuate individual telephone transmitters, these huge current values appear disproportionate, especially to readers familiar with the magneto telephone system, in which a couple of Leclanche elements or dry cells, located at the subscriber's premises, furnished all the necessary current for effective telephoning.

It has to be borne in mind, however, that the ingenious electro-mechanism of the



One of Four Monster Storage Cells to Be Used in Greater London—Low Capacity Wireless Batteries Are Shown in the Foreground.

Strowger automatic telephone system which is being introduced into the service of Greater London telephone subscribers calls for the expenditure of electrical energy to actuate it, and although individual Strowger switches do not make any heavy demand upon the source of supply, the aggregate consumption, when some thousands of people are telephoning or dialing simultaneously, is fairly heavy, quite apart from the current flowing out over the lines to the subscribers' premises to energize their tranmitters during actual conversation.

The four batteries each comprise 25 special J. F. L. W. 35 cells answering to the foregoing description. A special feature, apart from their abnormal dimensions and capacities, is the use of stoneware pedestal supports, eight per cell, in place of the more conventional wooden stillage. These stoneware pedestals are capped with smaller oil-type insulators, which are unaffected by moisture or acid, the combination being practically indestructible and insuring high insulation and immunity from leakage.

Some idea of the size of these monster telephone storage cells is afforded by the illustration which also depicts two famil-

The greatest protection for your cable

THE FIBRE CONDUIT CO. REG. U.S. ORANGEBURG PAT. OFF. ORANGEBURG, N.Y.

ORANGEBURG
FIBRE CONDUIT

THE dependability for which Orangeburg Fibre Conduit is so widely known is the result of thirty years' experience in manufacturing conduit for underground duct lines.

Complete and permanent protection is provided for your cables by the concrete monolith in which Fibre Conduit is encased. No ordinary hazards can injure them.

Orangeburg Fibre Conduit goes a long way toward making the service you are selling uninterrupted and less expensive to maintain.

Johns-Manville Trade Mark — Through — Electrical Materials for Utilities Jobber Contractor and Dealer

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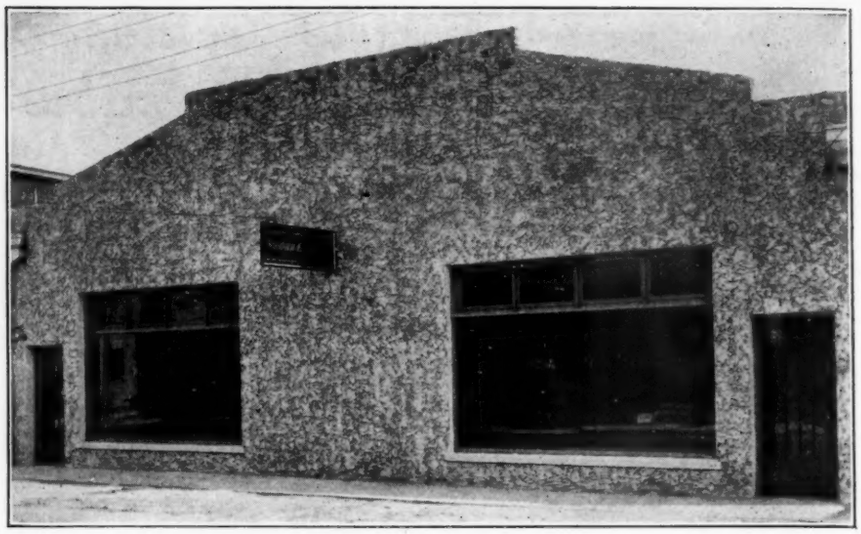
Sole Selling Agent for
The Fibre Conduit Co., Orangeburg, New York

iar low-capacity wireless batteries in the foreground.

Western Electric Supply House Opened at Miami, Fla.

The Western Electric Co. has recently opened to the public its new supply house at Miami, Fla. This substantial structure, a view of which is reproduced on this page, is located at 68 Twenty-fifth street, northeast, and has 6,500 square feet of floor space.



New Western Electric Supply House in Miami, Fla.

A Mayoral Visit to Automatic Telephone Mfg. Co.'s Plant.

The lord mayor of Liverpool, Alderman T. Dowd, and the Lady Mayoress, recently visited the works of Automatic Telephone Mfg. Co., Ltd., Milton Road, Edge Lane, Liverpool, and made a tour of the principal departments, during which they witnessed and had explained to them the many processes involved in the manufacture of Strowger automatic telephones and exchange equipment.

They were received and entertained by the chairman of the company, Sir Alexander Roger and his co-directors, Sir Max Muspratt, Bart., James Taylor and Dane Sinclair. Other members of the party comprised G. W. Moore, manager, Mrs. and Miss Moore and J. Nixon, works manager.

Following the inspection of the factory, which occupied about two hours and during which some interesting photographs were secured, there was an adjournment to the board room, where Sir Alexander Roger and Dane Sinclair welcomed the visitors in brief and informal speeches, to which the lord mayor suitably responded.

To mark the occasion, the lord mayor was presented with a small-scale model replica of a Strowger automatic desk telephone and the Lady Mayoress with a silver-plated Xcel kettle, one of the by-products of this modern and well-equipped factory.

Incidentally, it is of interest to record that the company's Liverpool works are now principally engaged upon the manufacture of Strowger automatic telephone equipment for Greater London, and other provincial towns, as well as for Tokyo, Japan, and Sydney, Australia.

The floor space, which, at the inception of the company in 1912, amounted to only 79,000 square feet, has now grown to 222,000 square feet and is still being increased to meet the exigencies of the growing demand for automatic telephones.

The Strowger automatic telephone industry in Liverpool now finds employment for upwards of 3,300 of both sexes, with a weekly wage bill amounting to over £7,000.

Group Inspecting Plant of Automatic Telephone Mfg. Co., Liverpool, England.—Left to Right: Sir Alexander Roger, Dave Sinclair, Miss Moore, Lady Mayoress and Lord Mayor Alderman T. Dowd of Liverpool.

New Name is "The French Battery Company."

A refinancing plan, whereby the French Battery Co. at Madison, Wis., will be able to greatly increase the output of that plant has been announced by officials of the company.

At a stockholders' meeting held at

POSITIONS WANTED

POSITION WANTED—As wire chief or Superintendent of Magneto System, Twenty years' experience. Will furnish tools, testing instruments and car; also best of references. Have some capital to invest. Prefer Missouri, Oklahoma or Texas. Address 6292, care of TELEPHONY.

POSITION WANTED—As lineman and troubleman on Magneto Exchange. Several years' experience. Will come on trial. Address 6287, care of TELEPHONY.

POSITION WANTED—As manager, wire chief or combined manager and wire chief. 18 years' experience. Desire a change. Address 6280, in care of TELEPHONY.

WANTED TO BUY

WANTED TO BUY—Telephone Exchange between 200 and 400 subscribers. Exchange in run-down condition preferred, in Missouri, Kansas, Nebraska or Iowa. Do not have much money to invest, but have had years of experience, having been in present position as Manager for 12 years. Address W. H. Moore, Box 206, Julian, Neb.

WANTED TO BUY—Telephone Exchange or small group of Exchanges in Florida or South Georgia. Give price with full particulars of property including toll connections and exchange rates, in first letter. Address Jos. E. Conn, 1803 Chase Ave., Cincinnati, Ohio.